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ART. LXVI.—*Report of the Visiting Committee of the New-York Horticultural Society for* 1829.

The Committee appointed to visit the Gardens in this vicinity, for the purpose of enabling them to lay before the society an account of the general state of our Horticultural improvements,

REPORT:—That they have collected, from various sources, whatever correct information it has been in their power to obtain on this interesting subject; and with a view to facilitate the objects of the society, they offer such observations as they think may be useful in assisting our further improvement in the cultivation of the various articles connected with the present state of our horticultural progression. As no better evidence can be obtained of the horticultural products cultivated in our vicinity than the actual exhibition of the various articles themselves, as offered for sale in our public markets, considerable attention has been paid to this part of the subject, and from the great variety, the abundance and cheapness of the whole, as well as from the high state of cultivation in which the generality of our market gardens are now kept, it appears evident that our improvements in Horticulture are advancing with a very successful progress. To allude to all the particulars in which these are conspicuous, would exceed the limits of the present undertaking. Yet our recent improvements in the culture of Cauliflower and Cape Broccoli, deserve special notice, as it appears evident our markets, instead of being supplied as formerly with these vegetables for only a few months, are now supplied with them in every month of the year. It may be gratifying to every lover of horticultural improvement to refer to those valuable reports on our vegetable markets, as published monthly in the New-York Farmer and Horticultural Repository, as it will there be seen that our markets have been lately supplied with both these vegetables in fine order and of excellent quality during a period of more than six months, including that season of the year the least propitious for affording many of the more delicate productions, viz. from the month of September, 1828, until the month of April of the present year. In the succeeding month of May, our earlier Cauliflowers again appeared in market, and the supply continued until July, in which month the supply of Broccoli recommenced, and still continues in fine order, accompanied as in last year with fine specimens of the Cauliflower.

Our cultivation of the Peach is also succeeding in a degree approaching to the prosperity of former years, and our markets, during the past season, have been supplied with great quantities of this delicious fruit, at from one to three dollars per bushel.

Our cultivation of the choicest varieties of the Melon is extensive and becoming well understood; and our supplies are so abundant that the finest sorts can frequently be purchased at a few cents each.

It does not appear that the cultivation of the Grape Vine has yet been commenced upon any proper plan for the supplying of our market, although there are abundant evidences of the practicability of growing its fruit in abundance; witness the fine crops produced in our town gardens, from one of which Dr. Hosack has taken two half bushel baskets full of the "White Muscadine Grapes," on the morning of our late anniversary, which, with similar samples from various other situations, decorated our tables and regaled our palates on that occasion. Perhaps a handsome premium offered by this society to the first cultivator, who would raise a certain quantity for the supply of our markets, would be attended with as beneficial effects as has been their encouragement given for the culture of "Broccoli," &c.

The gardiner, who first discovers and publishes to the community the most successful practical mode of cultivating any new Plant, or Fruit, or superior vegetable production, performs a far more valuable, and generally more difficult, service in the advancement of horticulture, than those who merely introduce or only partially succeed in the cultivation of the article.

Neither are the practical labors of our members, nor the publishing of their results, &c. alone calculated to advance the art and science of horticulture. The beneficial effects of the excellent discourses, which have been delivered by those eminent members of our society at the anniversary meetings, upon the history, the importance of the art and science, as well as upon the more elevated views of "The moral and intellectual resources of Horticulture," are inestimable. Our minds are as susceptible of valuable improvements by the writings of such men, as the plants we cultivate are by the labors of our hands. And as it is certain that no eminent degree of horticultural refinement can ever be obtained by those whose minds are wrapt up in ignorance, surely every means connected with our society calculated to enlighten the mind or elevate the soul ought to be held in a much higher degree of our estimation than has hitherto been paid to this inestimable species of contribution towards our intellectual as well as moral science.

Your committee have visited recently the chief part of all the market gardens in this vicinity, and have found them well stocked with the following vegetables for being laid in at the approach of severe weather for winter and early spring use, viz. Cauliflowers, Broccoli, Savoy, and other Cabbages. Beets, Carrots, Parsnips, Turnips, Salsify, and Celery; Parsley, Leeks, Lettuce, common Sallad and Spinnage are also abundant and in fine order for being slightly protected when necessary for winter and spring use. In garden frames placed upon the natural ground in sheltered situations,

are to be seen Lettuces in various stages of growth for present and successive supplies. Others are planted in the same way with Cauliflowers, and early cobbage plants, to be set out early in spring for table use in May and June. Neither these nor early Peas, &c. are sown or set out for good in the fall or winter months, as is the practice recommended by English writers on gardening, *where*, according to the best authenticated accounts, with which we are acquainted, the arrival of such articles at maturity, in the natural ground in the ensuing season, is nevertheless later than with us.

In the article of cabbage, particularly, we know of no country, where a more abundant supply of well formed, sound, firm headed sorts are to be met with, superior to those raised in this vicinity for the supply of our markets, especially during the whole of our winter season, the very period above all others in which their produce is most acceptable; and it is certain that in no vegetable whatever do our markets more excel than in that of the finest varieties of headed cabbage.

With respect to the process of forcing fruit or vegetables for the purpose of obtaining a supply at an earlier season than that in which they arrive at maturity in the natural ground, it does not appear there is much attention paid to it by our practical gardeners, owing, probably, to the very limited demand for articles raised in this way.

Perhaps the long continuation of the very abundant supplies of all the most delicious garden products raised in the natural ground, prevents our citizens from relishing an uninterrupted continuation of such a rich profusion. Nor need their taste, in this respect, at all be wondered at. Few would desire to partake all the days of their life at a continual feast.—Changes are often more agreeable where the alteration is calculated to gratify even by the diminution of things in some respects of superior qualities, than an uninterrupted enjoyment even of the finest thing without variation. Should their taste, however, alter, abundant extra supplies of fruit, vegetables, &c. could be grown with the greatest facility. This opinion is entertained with much confidence, from the experiments among us already had; and warrants the belief, that in this department of Horticulture there is room for the attention of our practical men; and with their success it is believed an enlightened public will be proud, and ever ready to patronize their exertions.

With respect to the state of private gardens, it does not appear that the same spirit of improvement has been extended to them in a similar degree to that exhibited in our market gardens. And although this is a matter of less consequence to the public, yet we think a more refined taste for the improvements of suburban and country residences might have been met with; some of them, it is true, are well stocked with a rich variety of choice fruit; others are accompanied with excellent kitchen gardens, and a few are ornamented with the decorations of the lawn, pleasure grounds, hothouse, green-house, &c. and the whole kept in good order.

The introduction of Cedar Hedges, as exhibited around the premises of the Lunatic Asylum, at Bloomingdale, under the charge of Mr. Scautlelery, attracted our particular attention. They are introduced upon a scale that would extend several miles in a direct line. They are neatly kept, and contribute in an eminent degree to the beauty, as well as advantage (by their shelter) of the place; and although their long unbroken continuation along each side of the walks may not be in so correct accordance with the modern rules of landscape gardening, yet they form a very interesting prospect, particularly during the winter season.

Upon the whole, we are of opinion that our Horticultural improvements have been commenced, and are advancing in the most propituous direction—and whoever recollects the former state of our markets, and could contrast their supplies with those of the present day, need be at no loss to form a tolerable estimate of the value of the labors, and influence of this society.

The above observations are made particularly in reference to the state of horticulture in our vicinity; and in conclusion we would briefly notice the very extensive influence which a taste for horticultural improvements is now exciting throughout our country generally. The great importance of the horticultural products of such a country as this, is becoming more generally appreciated, and understood than formerly; and this circumstance is opening a wide field for succesful operation in the art and science of American gardening. Within the last twelve months there have been formed three new horticultural societies in the interior of our state, and similar institutions have also recently been formed in the States of Massachusetts, and Pennsylvania. Great benefits may be expected to accrue from the influence of these societies, in impressing the minds of our yeomanry with the great importance of their attending more particularly to the improvements of their gardens and orchards, as well as in convincing them of the fact (not so well understood as it should be) that they enjoy a soil and climate eminently well calculated for growing every valuable species of horticultural productions.

How far (if at all) the successful progress of this society may have operated as an inducement to the formation of these new societies is not known to us, but we are well convinced of the great importance of the reciprocal benefits which the horticulturalists of our country will derive from these and every other additional institution of the kind; and we appreciate in a high degree the increasing advantages of that more extensive horticultural intercourse, which the present prospect affords good grounds to anticipate.

CHARLES CAKLEY, WILLIAM WILSON,
JOHN GROSHON, WILLIAM CURR,
ABRAHAM HALSEY, FRANCIS COOPER.

[From the American Farmer.]

ART. LXVII.—*On Bots in Horses.* By MORGAN LEWIS.

SIR,—Having seen in the Farmer various recipes for the cure of bots in horses, none of which have given general satisfaction, if we may judge from the inquiries which are still made for remedies; I send you one, on which I have practised for more than half a century with invariable success. I received it from a German veterinarian, who came to this country with the Baron Steuben, and was attached, as farrier, to the general staff of the main army, in the years 1778 and 9. He may be remembered by some of the military gentlemen of that day, under the dignified appellation of Count Saxe, a *nom de guerre*, given him by the Baron, on his entering our service. He was a man of great skill and celebrity in his profession. The ingredients are sim-

ple, and too mild to produce any injurious effects on the animal to whom they may be administered. They consist of new-milk, honey or molasses, common salt and water, and linseed oil. The manner of preparing and administering is as follows:

As soon as the disease (the symptoms of which are unerring,) is ascertained, drench the patient, fasting, if possible, with a quart of fresh milk, saturated with honey, molasses, or sugar; to be preferred in the order stated. Leave him at rest for two hours—at the expiration of which, having previously prepared some strong brine, by boiling as much common salt in water as can be dissolved in it, drench him as before, with a pint of it, when cool. After a similar period of two hours give him half a pint of linseed oil, and the remedy is complete.

The rationale, established, as I conceive, by a process I shall presently state, is as follows:

It is well ascertained that bots destroy the life of a horse, by feeding on the integuments of the stomach, and finally perforating it. Preferring, however, a sweetened milk, to a flesh diet, they detach themselves from the intestines, and glut the savory beverage. When satiated, their volume becomes enlarged, the skin extended and thin; in which state, the strong brine, by dissolving, destroys them.

The operation of the oil is to sheath the wounds they have inflicted, to aid the cathartic effects of the salt, and to carry off remaining impurities.

The process or experiment on which the aforegoing theory is found, shall now be stated. Some years since, when travelling, I stopped at the house of an intelligent and respectable inn-holder, in the village of Poughkeepsie, County of Dutchess, who had that morning lost a horse by bots. The remedy he had used, by advice of a physician, was spirit of turpentine; which failed of success. To satisfy himself, whether it would be effective under any circumstances, he had taken from the animal some worms after his death, and immersed them in the cup of the spirit, for the space of about an hour. He then presented to them a piece of crude flesh, to which they immediately attached themselves, and adhered so firmly as to be drawn from the vessel without loosing their hold, and appeared to have suffered no inconvenience from their immersion. I gave him my recipe, and he determined to try its effects, immediately upon a fresh parcel of worms. I could not wait to see the result; but was afterwards minutely informed by him, of his process and its effects. He selected four of the largest worms he could find, together with a part of the stomach to which they were attached, and immersed the whole in the prepared milk. They immediately quitted their hold of the fragment of the stomach, and gorged the liquid. In this situation they remained two hours, without touching the flesh they had quitted. When extracted, their size was more than doubled, and their skin so thin from extension as to render them semi-transparent. They were now placed in the brine, prepared as directed, and at the expiration of two hours they were not only lifeless, but nothing remained of them, but their heads and skins.

The following fact, will further serve to shew the complete efficacy of this remedy. At the first stage of a journey, in the month of June, having travelled moderately about twelve miles, my horse refused his feed; to which I paid little attention, supposing he had been well fed before I set out: at the next stage of about the same distance, he exhibited the most violent symptoms of a severe attack of bots. Such as great restlessness, rolling on the earth, and gnawing it—striking his feet against his abdomen, and biting his sides. I immediately administered my remedy, excepting the oil, which could not be procured. I shortly after turned him to pasture, where he soon began to eat, and the next morning was well enough to pursue his journey, without any signs of uneasiness, except when his sides were touched, which lasted but a few hours.

Horses may, by attention, be preserved at all times from a virulent attack by bots. A table spoonful of hickory ashes, with a handful of salt, mixed with their meal twice a week, will afford perfect security.

Whether its operation is prophylactic or remedial is of less consequence than to be ascertained of the fact, for which I do not hesitate to vouch. Should it, however, be the latter, and that the ashes and salt destroy the erucæ in their incipient state, it may be well to be acquainted with what physicians term the pathognomonic diagnostic, or the symptoms indicating the particular disease, and no other. In this stage of it, the animal affected, every four or five minutes, gradually raises his tail above the horizontal line of his back, and then lowers it with a twitching or jerking motion; making three or four stops or stages in its passage downwards. The ashes and salt may then be given: but should the symptom continue, the other remedy should be speedily resorted to, for the growth of the worm is very rapid.

The manner in which bots are produced, has been a subject of almost as much discussion, as the best mode of getting rid of them. A communication on this question made, some years since, by a Mr. Billings, to the agricultural society of Dutchess, puts it at rest. He states that he took some of the nits, attached to the hairs of a horse's legs, by what is usually called the bot bee; hatched them by the warmth of his hand; placed the vermiculi under glass, and fed them with animal food: in which situation they grew rapidly, went through the various transformations of pupa, &c. incident to the insect tribe, and terminated in the perfect bot bee, or fly.

ART. LXVIII.—*Construction and Uses of the Roller.*

MR. FESSENDEN,—Allow me to suggest a few hints on the construction and use of the Roller. For field husbandry, I have found the common sized Roller, of only 18 or 20 inches diameter, too small. After using one of this description for several years, I have laid it aside, and procured one to be made of about five feet in diameter, of the usual length, and in two parts. If the ground be very mellow, a small Roller is apt to draw it into ridges, the small stones to be crowded into heaps before it, rather than pressed into the earth where they lie, and the surface consequently left uneven; and when used upon the ground in the spring of the year, which had been sown with grass seed the fall previous, the roots of the tender plant are often injured by its tendency to *drag*, rather than to *roll* over the ground. These difficulties are all cured by enlarging the diameter. The large roller also moves easier, and the weight, falling more directly upon the small-

stones, they are better pressed into the earth, the lumps of earth more finely broken, and the surface left much more smoothed over.

My roller is of very simple and cheap construction. Four worn out and condemned wagon or cart wheels are placed upon an iron axle of about six feet in length and one and a half inches in diameter; the old holes in the hubs having been previously filled with wood, and a new hole made through this of proper size to admit the iron axle. The whole of the wheels are then covered with oak plank, four inches wide, and 2½ inches in thickness. The roller is then separated into two parts with the saw, leaving two wheels fastened together by the outside plank, for each half; a frame is then made round the whole, the ends of which are fitted on the ends of the axle; a brace of iron a quarter or half an inch in thickness, with a hole for the axle to turn in, is extended from the centre of the axle between the two parts of the roller, and fastened to the forward and after part of the frame, and a spire fitted into the forward part to draw by, completes the roller.

After eight years' experience in the use of the roller, upon grounds of all descriptions, I am fully convinced of its great utility, both upon grass and ploughed land. Seeds of all description, by the application of the roller, vegetate sooner, more evenly, and with much more certainty. One hour's work with the roller, after ploughing and harrowing, will do more in pulverizing the soil, and producing a finer tilth, than ten times the amount of labor with plough or harrow. One of its most beneficial uses is, however, upon ground, which, in the autumn previous, had been sowed down to grass. By the frequent changes of weather, during our winters, the roots of the young grass are often torn out of the ground. Let the roller be applied after the frost is out in spring, and before the ground has become entirely settled, and the effect produced, on comparing the part of a field rolled, with a part not rolled, would satisfy any one of its amazing utility on young grass. It is a mistaken idea, that the roller leaves the ground heavy. As well might the baker fear his bread would be made heavy by kneading his dough and smoothing the surface of his loaf. E. P.

Lexington, March, 1830.

[From the American Farmer.]

ART. LXIX.—*Taming Wild and Vicious Horses.*

I live in the country nearly all the year, and am what is called, in Carolina, "a small planter," (though I measure six feet,) and am a little of a farmer, though planting and farming are here regarded as distinct occupations. I returned home this evening, when the "day's work was over," and while my wife, who is counted one of the best knitters in these parts, at all events, has the length of her husband's foot to a notch, was finishing a winter stocking for me, I took up, for our mutual benefit, "Travels in the United States, by Captain Basin Hall"—on we read until this philosopher of the quarter-deck, as our Southern Review calls him, came to discuss the merits of the constitution, conjecture the probable durability of the government, and so forth—the chapter, when ended, seemed a long one, and I bid his majesty's officer good night, not thinking him altogether orthodox upon the subject of "popular feeling," or republican institutions. My eyes turned to the mantle piece, and the numbers of the American Turf Register and Sporting Magazine, were there. I opened one of them, and my attention was attracted to a communication, headed, "Taming Wild and Vicious Horses," and furnished by a correspondent in Elizabethtown, New-Jersey. I know of nothing more detestable than a baulking horse, and nothing more dangerous than a wild and vicious one, and cannot but regret, that your friend is not at liberty to impart a secret, by which the first may be made docile and true to his collar, and the second be subdued and made obedient to his rider. I hardly expect again to ride any thing less gentle than my chestnut mare Kitty Flanagan, or drive any thing less tractable than my old favorite grey Charley, but I would yet say a word on the score of taming wild and vicious horses. Some ten or twenty years ago, no matter which, I hunted the deer with as much zeal as any body, and as much success as most of my neighbours—I had a friend more addicted than myself to sport of all kinds, as good a horseman as I ever saw in a saddle, and the very best shot either at a buck, bounding through the forest, or at snipe, woodcock, or partridge, that ever I followed to the field. I have seen him on his hunter, "Black Raven," kill two deer, one with each barrel, both going at full speed; I have seen him flush a covey, and when two birds were in the act of crossing each other, fire and bag them both. We were once pursuing a wounded deer across the old fields, as they are called in a section of this state, known as the "Round O," a herd of horses, almost entirely wild, such as all have seen who reside near, or are acquainted with the country alluded to, set off at a gallop before we were within some hundreds of yards of them, and never ceased running until they reached the wood—it was then he mentioned to me the secret, I am now about to repeat to you, and which, by the by, is no secret at all, for I have told it to many others before you. What think you, said he, of taking the wildest of those horses, and taming him to-morrow, sufficiently to go to Charleston the next day? I answered, by a look of incredulity—with our three boys and ourselves, can we not get some of them into the large pasture, and then make up the fence too high for their escape? Agreed, and to it we went—by sun down, a gang of fifteen or twenty mares, colts, and stallions, were, after many failures, forced within the enclosure. Often they would come to the gap, and halting, would smell the ground, look about them, wheel suddenly, and run a mile without stopping, but they were in at last, and we left them till morning. Breakfast was soon over, and a noose being prepared, with a long line attached to it, we sallied forth to select a proper subject for our experiment. A cream colored stallion soon shewed himself worthy of the contest. We had five horsemen, and our plan was to separate the cream from the rest of the herd, and drive all out but himself; this was no "boys play," but at last he found himself alone, his companions had made the water splash, through the deserted rice fields, as far as we could see them, and even when out of sight, the "clanking hoof" was heard more and more faintly, till at length, distance had silenced the tumult of retreat. We now began to approach the cream, as he was soon afterwards called, and the mode we adopted was to mount one rider, pursue our object at full speed, in any direction he might take, and when horse or horseman flagged, to start a fresh one, who immediately continued the race, so that the cream was al-

ways at his best, and had five horses in good condition to contend with—thus we fatigued him, and brought him almost to let us come near him. Effort after effort was made to throw the noose about his neck; and many the slip, and many the tumble produced by the failure thereof. Once it got fairly over his head and hung upon his breast, but before it could be drawn taught enough to secure him, he gathered his feet well under him, and making a leap, passed through the rope—these feats, however, were not always to be performed, *his* spirit was giving way, and *ours* was increasing, as we were more and more successful. A fortunate trial, and the noose encircled his neck; he ran off and the slip knot was at his throat—quickly we were at a tree, and the other end of the cord was made fast to its trunk; it was now too late to hope for liberty again; it was gone forever; no struggle could reclaim it; we were sure of our captive, and having well secured him, were as willing to rest as the vanquished steed. Thus we left him an entire night, captured and enthralled, and as we thought subdued, but morning came, and the spirit and temper, which to us seemed broken and destroyed, we soon found were only changed. He became alternately furious and sullen; now, if we attempted to go near him, he would bound to the air, and put to trial the strength of his fetters, and now at the severest stripes he disdained to move. Every thing, however, was ready for our purposes, the stable door opened, and more hands being called, we determined to have our prisoner in by main force, and, *nolens volens*, the "cream," was soon, for the first time in his life, stabled and haltered. We paused; each drew a long breath, and the word was, how are we to approach him? He was desperate, and for a moment the issue seemed yet doubtful—one of the stalls had a large iron ring, fastened to the trough; we passed the end of the cord through the ring, and all of us pulling and urging, the poor fellow could resist no longer; he reared and plunged; we seized the chance, and his head was soon drawn down and firmly fixed. Kicking then, availed nothing; any one of common activity, could get over at the side of the stall, and avoid his heels altogether. A handful of tow was ordered and procured; the most fearless of our boys was selected to go in, and as he could no longer move his head, was directed to use the tow in stopping up both ears effectually—this done he was left to himself for a while, he shook most angrily his matted and uncombed mane, unwilling to submit—but we soon saw him droop—his eyes, no longer flashing their natural fire, had a dull and dizzy look, and his pointed ear no longer erect, hung loosely and heavily about. An hour passed away; he was completely conquered—the sense of hearing, upon which he had so often depended, was entirely gone; the sentinel that warned him of his foes' approach, could speak no more; he was perfectly deaf. A bridle being put on, he was brought out, and "Jim" ordered to mount him bare back—forward he moved, or quietly stood still, in obedience to the whip or the bit, as either were applied. I never saw a more ungovernable horse, or one more thoroughly subdued. I have tried repeatedly the same experiment of stopping up ears; taking away the power of hearing altogether, and never knew it to fail.—It would be easy for me to give you authority in corroboration of my own experience, but the trial is so easily made that all concerned may judge for themselves. In my own mind there is no doubt that this is the secret of many masters of the history of horse breaking, and perhaps our friend Drinnen, may have known all about it.

—— *Parish, South Carolina.*

ART. LXX.—*Notice of Physicians, who have distinguished themselves in Botany.* [Continued from page 59.]

SAMUEL COLLINS, was born in the early part of the 17th century. After studying at Cambridge and Oxford, he went to the Russian court as physician, and continued there nine years. On his return, he was made Fellow of the College of Physicians in London. He afterwards published a History of the Court of Russia, and, in 1685, a system of anatomy, treating of the body of man, animals, and plants, with numerous plates. The comparative anatomy, to which Dr. Tyson greatly contributed, was much admired, though now superseded by other publications.

GABRIEL FALLOPIUS, a physician of Modena, was born about the year 1523. He showed early great zeal in anatomy, botany, chemistry, and other branches of knowledge; and after studying in Italy, travelled to other countries for his improvement. In 1548, he was appointed professor of anatomy at Pisa, and three years after at Padua; where he also taught botany, but with less celebrity. His death happened in 1563. He distinguished himself, not only as an anatomist, but also in medicine and surgery. Douglas has characterized him as highly systematic in teaching, successful in treating diseases, and expeditious in operating. Some of the discoveries, to which he laid claim, appear to have been anticipated; as, for instance, the tubes proceeding from the uterus, though generally called after him *Fallopian*.

However, he has the merit of recovering many of the observations of the ancients, which had fallen into oblivion. His "Observationes Anatomicæ," published in 1561, was one of the best works of the 16th century; in this some of the errors, which had escaped his master, Vesalius, are modestly pointed out. Many other publications, ascribed to him, were printed after his death; some of which, are evidently spurious.

JOHN FOTHERGILL, was born in Yorkshire, in 1712, of a respectable Quaker family. After passing through an apprenticeship to an apothecary, he went to Edinburgh, where he graduated at the age of twenty-four, taking for his inaugural thesis the use of emetics. He then studied for two years at St. Thomas's Hospital, and after an excursion to the continent, settled in London in 1740, and six years after became a licentiate. His practice was for some time chiefly gratuitous; but his "Account of the Putrid Sore Throat," published in 1748, brought him speedily into reputation. He was successively elected a Fellow of the College of Physicians at Edinburgh, of the Royal Society of London, and of some other Societies abroad.

His early partiality to botany induced him, as his practice increased, to purchase a large piece of ground for the cultivation of rare and valuable plants, in which he spared no expense; neither did he neglect other departments of natural history. He was also an active and liberal promoter of many successful schemes for the public benefit; and particularly in instituting the school at Ackworth in Yorkshire. He was of a rather

delicate constitution, but a steady temperance preserved his health, till in 1778 he had an attack of a suppression of urine, occasioned by a disease of the prostate gland; which, returning two years after, soon put a period to his existence.

He had a quick and comprehensive understanding; and his pleasing address procured him general confidence, which his discretion was not apt to forfeit afterwards. Besides the works already noticed, several papers of Dr. Fothergill were printed in the Philosophical Transactions, and in the Medical Observations and Inquiries: he also sent several communications to the Gentleman's Magazine, and other periodical publications.

Stephen Francis Geoffroy, was born at Paris in 1672. After giving him an excellent general education, his father, who was an apothecary, sent him to study his own profession at Montpelier; where he attended the several lectures. On his return to Paris, having already acquired considerable reputation, he was appointed to attend the Duke de Tallard, on his embassy to England, in 1698. Here he was very favorably received, and elected a member of the Royal Society: and he afterward visited Holland and Italy. His attention was chiefly directed to natural history and the materia medica, his father wishing him to succeed to his establishment at Paris: however, he became ambitious of the higher branch of the profession, and at length graduated in 1704. His reputation rapidly increased; and he was called in consultation even by the most distinguished practitioners. In 1709 he was appointed to the professorship of medicine on the death of Tournefort. He then undertook to deliver to his pupils a complete History of the Materia Medica, divided into mineral, vegetable, and animal substances; the first part of which he finished, and about half the second: this was afterward published from his papers, in Latin, in three octavo volumes. In 1712, he was made professor of chemistry in the king's garden; and 14 years after, dean of the faculty.

In this office he was led into some active disputes; whence his health naturally delicate, began to decline; and he died in the beginning of 1731. Notwithstanding his illness, however, he completed a work, which had been deemed necessary by preceding deans, but never accomplished; namely, a Pharmacopœia, which was published under the name of "Codc Medicamentaire de la Faculte de Paris."

Conrad Gesner, was born at Zurich, in 1516. His father was killed in the civil war, and left him in such poverty, that he was obliged to become a servant at Strasburg. His master allowed him to devote some time to study, in which he made great progress; and having acquired a little money, he went to Paris, where he improved rapidly in the classics and rhetoric, and then turned his attention to philosophy and medicine. But he was soon compelled to return to his native country, and teach the languages, &c. for a livelihood. This enabled him afterward to resume his medical studies at Montpelier, and he graduated at Basil in 1540. He then settled in his native city, where he was appointed professor of philosophy, which office he discharged with great reputation for twenty-four years. He had an early predilection for botany, which led him to cultivate other parts of natural history; he was the first collector of a museum, and acquired the character of being the greatest naturalist since Aristotle. He also founded and supported a botanic garden, had numerous drawings and wood engravings made of plants, and appears to have meditated a general work on that subject. He likewise discovered the only true principles of botanical arrangement in the flower and fruit. Though of a feeble and sickly constitution, he traversed the Alps, and even sometimes plunged into the waters in search of plants: he also carefully studied their medical properties, and frequently hazarded his life by experiments on himself; indeed he was at one time reported to have been killed by the root of doronicum. His other occupations prevented his entering very extensively into practice, but his enlarged views rendered him successful; and the profits of his profession enabled him to support the great expense of his favorite pursuits.

He gave also many proofs of liberal and active friendship. He died of the plague, in 1565. His chief works are his "Historiæ Animalium," in three folio volumes, with wood cuts; and a pharmacopœia, entitled, "De Secretis Remediis Thesaurus," which passed through many editions.

Thomas Green. The family of Green has made itself remarkable, in the medical profession, by its humble and singular origin. The subject of this notice, the medical ancestor of the family, was born in Malden, and was one of the first settlers of Leicester, county of Worcester, Massachusetts. He received his first medical impressions, and impulse, from a book given him by a surgeon of a British ship, who resided a few months at his father's, and took an interest in his vigorous and opening intellect. His outfit, for the wilderness, consisted of his gun, his axe, his book, his sack, and his cow. His first habitation was built by nature, its roof composed of a shelving rock. Here he passed the night in sound repose, after the labor of the day, in felling and clearing the forest.

Soon after he began his settlement, he was attacked by a fever. Foreseeing the difficulties which must attend his situation, without a friendly hand to administer even the scanty necessaries of life, he had the precaution to tie a young calf to his cabin, formed under the rock. By this stratagem he was enabled to obtain sustenance from the cow, as often as she returned to give nourishment to her young. In this manner he derived his support for some weeks. By the aid of his book, and the knowledge of simples, a proficiency in which he early acquired by an intercourse with the Indians, he was soon enabled to prescribe successfully for the simple maladies of his fellow-settlers. By practice from the necessity of the case, as well as from choice, he acquired theory and skill, and soon rose to great reputation.

Thus, from fortuitous circumstance, and an humble beginning, the name of Green has attained its present eminence in the medical profession.—*Thacher's Med. Biog.*

Dr. John Green, (senior,) son of the above mentioned, was born at Leicester, in the year 1736. By the aid of his father, he early became a physician, and settled at Worcester. He married a daughter of Brigadier Ruggles, of Hardwick, and became the father of a large family. Not satisfied, as too many are, with the limited means of knowledge which necessarily fell to his lot, he afforded his children the best education in his power. He was extensively employed, and distinguished himself for his tenderness and fidelity. He in-

herited a taste and skill in botany, with his profession, from his father. In his garden were to be found the useful plant, the healing herb, and the grateful fruit; which either his humanity bestowed on the sick, or his hospitality on his friends. He died, November 29th, 1799, aged sixty-three years.—*Thacher's Medical Biography.*

Nehemiah Grew, was born at Coventry; where, after graduating at some foreign university, he settled in practice. He there formed the idea of studying the anatomy of plants. His first essay on this subject was communicated to the Royal Society in 1670, and met with great approbation: whence he was induced to settle in London, and two years after became a fellow of that society; of which he was also at one period secretary.

In 1680 he was made an honorary fellow of the College of Physicians. He is said to have attained considerable practice, and died in 1711. His "Anatomy of Vegetable Roots and Trunks," is a large collection of original and useful facts; though his theories have been invalidated by subsequent discoveries. He had no correct ideas of the propulsion or direction of the sap; but he was one of the first who adopted the doctrine of the sexes of plants; nor did even the principles of methodical arrangement entirely escape his notice. In 1681, he published a descriptive catalogue of the Museum of the Royal Society; to which were added some lectures on the comparative anatomy of the stomach and intestines. Another publication was entitled "Cosmographia Sacra, or a Discourse of the Universe; as it is the Creature and Kingdom of God." His works were soon translated into French and Latin: but the latter very incorrectly.

Albert Haller, was born at Berne, where his father was an advocate, in 1709. He displayed, at a very early age, extraordinary marks of industry and talents. He was intended for the church, but having lost his father when only thirteen, he soon after determined upon the medical profession. Having studied a short time at Tubingen, he was attracted to Leyden by the reputation of Boerhaave, to whom he has expressed his obligations in the most affectionate terms; but he took his degree at the former place, when about seventeen years of age.

He soon after visited England and France; then returning to his native country, first acquired a taste for botany, which he pursued with great zeal, making frequent excursions to the neighboring mountains. He also composed a "Poem on the Alps," and other pieces, which were received with much applause. Having settled in his native city, about 1730, he began to give lecures on anatomy, but with indifferent success; and some detached pieces on anatomy and botany having gained him considerable reputation abroad, he was invited by George II., in 1736, to become professor in the university which he had recently founded at Gottingen. He accepted this advantageous offer, and, though his arrival was rendered melancholy by the loss of a beloved wife, from some accident which occurred in the journey, he commenced at once the duties of his office with great zeal; he encouraged the most industrious of his pupils to institute an experimental investigation on some part of the animal economy, affording them his assistance therein. He was likewise himself indefatigable in similar researches, during the seventeen years which he spent there, having in view a grand reform in physiology, which his writings ultimately effected, dissipating the metaphysical and chemical jargon, whereby it was before obscured. He procured the establishment of a botanic garden, an anatomical theatre, a school for surgery and midwifery, with a lying-in hospital, and other useful institutions at that university.

He received also many honorable testimonies of his fame, being chosen a member of the Royal Societies of Stockholm and London, made physician and counsellor to George II., and the emperor conferred on him the title of Baron; which, however, he declined, as it would not have been esteemed in his native country. To this he returned in 1753, and during the remainder of his life, discharged various important public offices there. He ultimately received every testimony of the general estimation in which he was held; the learned societies of Europe, as well as several sovereigns, vying with each other in conferring honors upon him. His constitution was delicate, and impatience of pain, or interruption to his studies, led him to use violent remedies when ill; however, by temperance and activity, he reached an advanced age, having died towards the end of 1777. He was one of the most universally informed men in modern times. He spoke with equal facility the German, French, and Latin languages; and read all the other tongues of Europe, except the Sclavonic; and there was scarcely any book of reputation, with which he was not acquainted.

His own works were extremely numerous, on anatomy, physiology, pathology, surgery, botany, &c., besides his poems and political and religious publications. The principal are, 1. His large work on the Botany of Switzerland, in 3 vols. folio, with many plates; 2. Commentaries on Boerhaave's Lectures, 7 vols. octavo; 3. Elements of Physiology, 8 vols. quarto, a work of the greatest merit; 4. His "Bibliotheca," or Chronological Histories of Authors, with brief Analyses; 2 vols. quarto on Botany, two on Surgery, two on Anatomy, and four on the Practice of Medicine, displaying an immense body of research.

Lawrence Heister, was born at Frankfort on the Maine in 1683. After studying in different German universities, and serving sometime as an army surgeon, he graduated at Leyden: and in 1709 was appointed physician general to the Dutch Military Hospital. The next year he became professor of anatomy and surgery at Altorf: and having distinguished himself greatly by his lectures and writings, he received in 1720 a more advantageous appointment at Helmstadt, under the Duke of Brunswick, as physician, Aulic counsellor, and professor of medicine; in which he continued, notwithstanding an invitation to Russia from the Czar, Peter, till the period of his death in 1758. He was author of several esteemed works, particularly a Compendium of Anatomy, which became very popular, being remarkable for its conciseness and clearness. "His Institutions of Surgery," also gained him great credit; being translated into Latin, and most of the modern languages of Europe. Another valuable and practical work was entitled "Medical, Surgical, and Anatomical Cases and Observations." He had some taste for Botany, also, which he taught at Helmstadt, and considerably enriched the garden there, but he unfortunately became an antagonist of the celebrated Linnæus,

not properly appreciating the excellence of the system of that eminent naturalist.

John James Huber, was born at Basle in 1707, and graduated there at the age of 26, after studying under the celebrated Haller, and other able teachers. Two years after he was appointed physician to the court of Baden Dourlach. He materially assisted Haller in his work on the Botany of Switzerland, and was consequently invited by him in 1738 to be dissector at Gottingen.

He speedily rose to considerable reputation there, and received different public appointments. He had likewise the honor of being elected into the most celebrated of the learned societies in Europe. He died in 1778.

Charles Linnæus, was born in Sweden in 1707. He derived, at a very early age from his father, that attachment to the study of nature by which he afterward so eminently distinguished himself. He was intended for the church, but made so little improvement in the requisite learning, that this was soon abandoned for the profession of medicine. He appears to have had a singular inaptitude for learning languages; though he was sufficiently versed in Latin. His scanty finances much embarrassed his progress at first; but his taste for botany at length having procured him the patronage of Dr. Celsius, professor of divinity at Upsal, he was enabled to pursue his studies to more advantage. In 1730, he was appointed to give lectures in the botanic garden, and began to compose some of those works, by which he rendered his favorite science more philosophical, and more popular than it had ever been before. Two years afterward he was commissioned to make a tour through Lapland, of which he subsequently published an interesting account; and having learned the art of assaying metals, he gave lectures on this subject also on his return. In 1735, he took his degree in physic at Harderwyck, and in his inaugural dissertation advanced a strange hypothesis, that intermittent fevers are owing to particles of clay, taken in with the food, obstructing the minute arteries. Soon after this, his Systema Naturæ first appeared; which was greatly enlarged and improved in numerous successive editions.

In Holland he fortunately obtained the support of a Mr. Clifford, an opulent banker, whereby he was enabled to visit England also; but his great exertions afterward impaired his health, and being attacked with a severe intermittent, he could not resist the desire, when somewhat recovered, of returning to his native country. Arriving there in 1738, he settled at Stockholm, where his reputation soon procured him some medical practice, and the appointment of physician to the navy, as well as lecturer on botany and mineralogy; a literary society was also established, of which he was the first president, and by which numerous volumes of transactions have since been published.

In 1740, he was chosen professor of medicine at Upsal, having been admitted a member of that academy on his return to Sweden; he also shared with Dr. Rosen the botanical duties, and considerably improved the garden; he was afterward made secretary, and on some public occasions did the honor of the university. He received likewise marks of distinction from several foreign societies. About the year 1746, he was appointed Archiater; and it became an object of national interest to make additions to his collection from every part of the world. A systematic treatise on the Materia Medica was published by him in 1749; and two years after his Philosophia Botanica, composed during a severe fit of the gout, in which he supposed himself to have derived great benefit from taking a large quantity of wood strawberries. This was soon followed by his great work, the Species Plantarum; after which he was honored with the order of the Polar Star, never before conferred for literary merit; and having declined a splendid invitation to Spain, he was raised to the rank of nobility. In 1763 his son was allowed to assist him in the botanical duties. About this time he published his Genera Morborum, and three years after his Clavis Medicinæ.

His medical lectures, though too theoretical, were very much esteemed; but he had declined general practice on his establishment at Upsal. As he advanced in life, the fatiguing occupations in which he was engaged impaired his health, notwithstanding his temperate and regular habits; and at length brought on his dissolution in 1778. This was regarded as a loss to the nation, and even to the world.

About ten years after, a society, adopting his name, was formed in this country, which has published many valuable volumes of transactions, and the president purchased Linnæus's collections of his widow; similar institutions have also been established in other parts of the world.

Marcello Malpighi, was born near Bologna, in 1628. He went through his preliminary studies with great eclat, and especially distinguished himself by his zealous pursuit of anatomy. His merit procured him, in 1653, the degree of doctor in medicine, and, three years after, the appointment of professor of physic, at Bologna; but he was soon invited to Pisa, by the Grand Duke of Tuscany. However, the air of this place injuring his health, which was naturally delicate, he was obliged, in 1659, to return to his office at Bologna.

Three years after, he was tempted by the magistrates of Messina to accept the medical professorship there; but his little deference to ancient authorities involved him in controversies with his colleagues, which forced him to return again to Bologna, in 1666. His reputation rapidly extended throughout Europe, as a philosophical inquirer, and he was chosen a member of the Royal Society of London, which afterward printed his works at their own expense. In 1691, Pope Innocent XII., on his election, chose Malpighi for his chief physician and chamberlain, when he removed to Rome; but, three years after, he was carried off by an apoplectic stroke.

He joined, with an indefatigable pursuit of knowledge, a remarkable degree of candour and modesty; and ranks very high among the philosophers of the physiological age in which he lived. He was the first to employ the microscope in examining the circulation of the blood; and the same instrument assisted him in exploring the minute structure of various organs, as is evident from his first publication on the lungs, in 1661; and this was followed by successive treatises on many other parts.

In 1669, his essay, "De Formatione Pulli in Ovo," was printed at London, with his remarks on the silkworm, and on the conglobate glands: much light was thrown by these investigations on the obscure subject of generation, and other important points of physiology.

He was thence led to the consideration of the structure and functions of plants, and evinced himself an original, as well as a very profound observer. His "Anatome Plantarum" was published by the Royal Society, in 1675 and 1679, with some observations on the incubation of the egg. His only medical work, "Consultationum Medicinalium Centuria Prima," did not appear till 1713: he was not distinguished as a practitioner, but deserves praise for pointing out the mischief of bleeding, in the malignant epidemics which prevailed in Italy in his time.

(To be Continued.)

ART. LXXI.—*Prohibitory Duties—Report of the Committee on Commerce and Navigation to the House of Representatives—French Commercial System.* By the EDITOR. [Continued from page 64.]

Mr. Cambreleng is of opinion that our revenue is much less than it would be, did not the high duties encourage smuggling and lessen general consumption. In 1745, a reduction of duty on tea in England from 4s. to 1s. per pound was followed by an increase of consumption from 728,150 to 4,866,180 pounds. After the second reduction in 1784, the consumption was trebled in three years. In 1787, the duties on French wines and brandy was reduced fifty per cent. but the revenue was increased from the greater consumption.

The great difficulty of enforcing revenue laws, when high duties are laid, often frustrates the object in view, particularly in a country situated as are the United States. Although we have numerous custom house officers, and give a large share of the condemned merchandise to those who detect smuggled goods, thus enlisting a great portion of the community in the cause, yet the devices of self interest, render our laws, in some measure, at least, nugatory. The expenses of Great Britain in 1829, in protecting her coast against smuggling, was $1,900,000 independent of an expensive coast blockade, ready to be called into the service. The whole expense of collecting her customs and excise in 1828, was two millions more than the whole military, naval, and civil disbursements of our general government. France has three lines of revenue guards along the coast, one within the other, consisting of *twenty-three thousand* men. The expenses of collecting her revenue, and other taxes in 1829, exceeded *twenty-four millions* of dollars. The line of our military frontier, independent of our Atlantic border, is five thousand miles. If we should carry the prohibitory system in operation to the extent that Great Britain and France have done, it is easy to see that we shall be carried into, at least, an untried scene. The Committee thus speak of the opposition in Great Britain to the modern policy of her ministers, and of the effects of this policy.

"The French Revolution and the subsequent wars suspended all liberal reciprocity in commerce. The same enlightened policy was forcibly recommended in 1793, by one of our most distinguished statesmen, whose report we shall have occasion particularly to notice. After the European war was over, Great Britain still, for a time, pursued her old measures, and continued to augment her duties. But it was not long before she discovered the folly of such a course, and returned to the sound commercial policy of Mr. Pitt. Mr. Huskisson, under the administration of Mr. Canning, proposed important changes in the colonial and commercial system of Great Britain. That ministry commenced a legislative war against those ancient and stubborn prejudices in favor of prohibitions which had closed or narrowed almost every channel of trade. They wisely and steadily persevered till they reduced the duty on wool, iron, silk, cotton, and their manufactures—nay, on almost every raw material and manufacture, without regard to foreign competition, and in spite of the outcries and remonstrances of the wool growers, iron masters, and manufacturers, who, according to their own wise calculations, were to be inevitably ruined by enabling the British people to live cheaper, and by substituting free trade for restrictions—new life for lethargy. The statement, No. 6, shows what changes have been made by Parliament since the war. The alarmed capitalists of that country were astonished to see silk, wool, iron—all raw materials and manufactures—British and foreign indiscriminately—exported and imported; the consumption and exportation of foreign and British productions greater than before; new channels of trade opened; old ones enlarged and importations increased; and that all these things should exist without making them bankrupts. The ship owners denounced the ministry; British navigation, according to their sage predictions, would be ruined if the colonies were permitted to enjoy the liberty of trading with foreign nations. The most calamitous consequences would result from brushing away their ancient colonial restrictions, and the naval glory of Great Britain would be extinguished forever. Ministers were, however, inexorable; the colonies were emancipated; and, to their astonishment, British navigation increased in every branch which had been liberated, notwithstanding the loud remonstrances and melancholy predictions of the shipping interest. And what was still more strange to them, their navigation increased least with those colonies which their selfish counsels had aided in retaining in colonial vassalage. While the navigation of Great Britain, with her emancipated Northern provinces, increased from 88,247 to 400,841 tons, the tonnage employed in trading between the mother country and all her West India colonies began, in 1814, at 242,082, and ended, in 1828, at 272,800; the three previous years averaging actually less than the tonnage of 1814."

That our readers may have specimen of the "outcries and remonstrances of the wool growers," &c. we give the following extract from the British Farmer's Magazine, for Feb. 1830.

"The great and increasing distress of the Agricultural Interest," says the writer, "has become so glaring and so obvious, that no one can venture to deny it, whatever sophisms may be resorted to by the advocates of free trade, or by heartless political economists, to palliate the too evident evil, or to avert the force of the arguments that naturally arise out of its existence and alarming progress. Their favorite doctrine has been, that the depression is only temporary, and that the inconvenience must be submitted to, in order to ensure a large ultimate gain, and in the meantime to right the vessel of the state. But if that distant point of safety, or advantage, is at so great a distance that the vessel is wrecked, together with all on board of it, before the promised haven can be reached, is it meant to be asserted, that no intermediate measures of preservation are to be resorted to or adopted?

"Precisely in this state are the Land-owners, the Farmers, and the Agricultural Laborers; they are sinking, fast sinking, into irretrievable embarrassment, distress, and pauperism, whilst measures are carrying into effect to add to their difficulties, but none to relieve them. To have a remunerating market for the sale of the produce of the soil, and a sufficient circulating medium for the use of those who cultivate it, are requisites so essential to the prosperity of Agriculture, that none but those who begin their reasoning at the wrong end—that is to say, who raise in theory a visionary superstructure, and then endeavor tortuously to fit it, to the basis that actually exists, instead of taking that basis as the foundation of practical measures—can pretend to contradict the allegation of their absolute necessity.

"It is to the baneful system of free trade, and to the abstract doctrine of currency—acted upon without any due regard to the practically essential interests of the empire—that all these evils are to be attributed. It is in vain to say that a principle is right, if in practical operation it produces nothing but wrong, and injustice, and calamity. Who, but a madman, would stop to reason about a fire, when the raging conflagration was threatening wide spreading devastation before his eyes? The evils that I have touched upon, are, as every one knows, unhappily too real, and of too great and increasing a magnitude, to be denied. If abstract principles are to be acted upon, in defiance of common sense, and of undeniably ruinous practical effects, then farewell to all the prosperity of Britain, to the welfare, the comfort, and even the means of subsistence, of the greater part of the population of the British empire; pauperism, and wretchedness, and misery, must supply their place, and Great Britain become a mere name, for *great* it can can no longer be.

"To attempt to argue further would be needless; disputable, undeniable facts, speak for themselves; something *must* be done to save the wreck of the property of the Agriculturists; or, if that is denied, Farmers must universally give up their farms, and the Proprietors of the soil must work it, and cultivate it, as they can."

The committee recommend as the wisest course to save our navigation, "the repeal of every tax levied on hemp, iron and sail cloth, since 1807." "We must repeal our tonnage duties, reduce our taxes on ship building, allow a drawback equivalent to the duty on the materials, extend our debenture system on exported manufactures to the extent of the import on articles consumed in the manufacture, and enlarge our intercourse with foreign nations, by abolishing prohibitory duties, and securing the reciprocal admission of produce and manufactures to a maximum rate, compatable with the mutual interests, and modified to suit the peculiar necessities of countries." In speaking of England and France, the committee say, "after a restrictive competition for almost four centuries, during which the French had uniformly maintained a triumphant superiority, Parliament, in direct opposition to the clamors of manufactures, abolished the prohibitory duties on French silks, and substituted a duty of 30 per cent. ad valorem for revenue and protection. Instead of that ruin which was so confidently predicted, the consumption of the raw material, the very best evidence of the growth of the manufacture increased in five years from 2,432,286 to 4,544,564 pounds annually, notwithstanding the French competition."

(*To be continued.*)

ART. LXXII.—*Physical Effects of the Deluge.*

[Continued from Page 57.]

If there be any human remains, hitherto ascertained, that may be referred to the diluvial catastrophe, they are, perhaps, those discovered in the cavern of Durfort, in France, and in the quarries of Kosrutz, in Germany. It would appear possible, perhaps probable, that the human remains found in these situations, were deposited there by the deluge. Such discoveries may be, hereafter, multiplied. They should be received with caution; but they cannot fail to be acceptable, both to the friends of geology and of the early scripture history.

When it is considered, that, excepting straggling colonies, scattered here and there, in remoter countries, the human family, at the time of the deluge, had probably not extended far beyond the neighborhood of the Euphrates, the Tigris and other vicinal Asiatic countries; that even those countries may not have been, at that time, very populous; that many of the corpses may have been swept into the ocean, many more buried deep in diluvium or in accidental cavities and fissures; that those countries, being without curiosity and without science; and under an arbitrary and jealous government, there is little probability, that discoveries relating to the extirpated human family would be made, or, if made accidentally, that the remains would be regarded by the ignorant and incurious inhabitants, in any other light, than those found in burying grounds.

Under a different sway, it is not, perhaps, improbable, that diluvial human bones may hereafter be found in Asia; but under present circumstances, their absence does not operate, in any degree, against the reality of the deluge, attested as it is, by so many geological facts, as well as by the history.

Remains of Animals and Vegetables.

These are very numerous and equally unquestionable.

We would by no means insist, that every skeleton and bone, found in diluvium, was buried there by the grand catastrophe. We are willing to allow a reasonable number, and all that can on probable evidence be thus referred, to mere accidents, and to diluvium or alluvium, of a more modern date than that of the deluge.

Single bones, parts of skeletons, and entire skeletons of the larger animals, often of extinct species, but mostly of known genera, are found abundantly in the diluvium of all countries, where curiosity and intelligence exist.

Whales, sharks, and other fishes; crocodiles and other amphibia; the mammoth or the extinct elephant; species of elephants, nearly or quite like those of modern times; the rhinoceros, the hippopotamus; hyenas, tigers, deer, horses; various species of the bovine family, and a multitude more, are found buried in the diluvium, at a greater or less depth; and in most instances, under circumstances indicating that they were buried by the same catastrophe, which destroyed them; namely, a sudden and violent deluge.

The interesting and instructive geological essays of Dr. H. H. Hayden, may be consulted, for a series of facts, relating to the diluvium of the Atlantic portion of the middle and southern states of North America. It appears, that under this diluvium, there is buried a great quantity of the bones of whales, sharks, porpoises, mammoths, Asiatic elephants and other large animals, along with numerous trees, sometimes with their fruit. Layers of marine mud, are also found deep beneath the diluvium, below the present low water mark.

There are also vast quantities of shells, and especially of a gigantic oyster, in many parts of the southern states. They are found, not only in digging for wells, but they form vast beds in various places.

One of the largest beds on the eastern continent, is near Tours, in France; it is twenty-seven miles long and twenty feet thick.

But the beds of the southern states far exceed this. A stratum, on the whole continuous, although mixed, more or less, with the general diluvium, and other materials of the country, has been traced from the Eutaw springs, in South Carolina, to the Chickasaw country; six hundred miles in length, by ten, or from that to one hundred in breadth.

There can be little doubt that many of the beds of oyster shells which have been attributed to the aboriginal Indians of this country, are diluvial deposits.

The bones and skeletons of large animals, especially of the mammoth, are found in wide dispersion, and in very remote countries; in both Americas, in Europe and in Asia. In northern Asia, the tusks of the extinct elephant, are discovered in the diluvial banks of almost every river, and the ivory is found in such abundance as to be a regular article of commerce. An enormous carcase, of the northern or Asiatic elephant, a few years since, by the gradual thawing of the frozen bank, in which it was imbedded, high above the water, fell down and exhibited the flesh in full preservation; the long bristly hair and vast massy hide, requiring a large number of men, to carry it, afforded proof irrefragable, of the existence of the animal in those rigorous climates, and of his sudden extinction, inhumation and congelation, with so little interval of time, that putrefaction had not commenced, and had not since taken place.

Indeed, there is but one view which appears to carry with it the least probability, as to the cause of the wide dispersion and sepulture of the gigantic races; especially of extinct animals in the various quarters of the world. It seems evidently to have been the work of the deluge, which at once drowned, and in many instances, extinguished whole races of animals, and buried their bodies in the wreck of the planet with which those waters were evidently filled. Such a scene of awful devastation, was as well fitted to produce these effects, as it was ill adapted, to the comparatively tranquil life and death of the successive generations of marine and aqueous animals, that peopled the early ocean in its middle and later stages. Organized remains are found at very high levels, not only mineralized, but loose, or in diluvium, thus proving the prevalence of the ocean, at different periods.

It is said that the skeleton of a whale lies on the top of the mountain Sandhorn, on the coast of the northern sea. The mountain is three thousand feet high, and there is no cause that could have conveyed the whale to that elevation, except a deluge rising to that height.

So late as June, 1824, the remains of a whale were found on the westernmost Stappen, a mountain in Finmarck, at an elevation of eight hundred feet above the ocean. The specimens which were reported to be vertebræ, were lost by shipwreck on their passage to England. Similar remains are said to exist also in North Fugeloe, another mountain in these regions.

It is common to find trees and their members in the diluvium, and also in the known alluvium of rivers, &c. In general, they are not much altered; sometimes they are partially bituminized or verge towards lignite, or perhaps are really lignite; at other times, they are penetrated by acids and saline substances, and metallic minerals, as pyrites are occasionally formed upon them.

It has been already said, that there is no difference in the nature of the operations by which diluvium and alluvium are produced, and that we must resort to an induction of particulars in order to enable us to distinguish between them; but in most situations, especially those that are remote from rivers and moving waters, there is very little occasion for hesitation, in forming an opinion.

Extinction of Animal Races by the Deluge.

We cannot reasonably doubt, that many of the skeletons and bones of the animal races, which we find buried in ancient diluvium, in cavcrns, and in fissures in rocks, were covered by the wreck and sediment of the deluge; others have evidently been covered since, by ordinary or extraordinary events, and our decision, as to the era to which we are to assign them, respectively, must depend on the circumstances of each particular case.

But, is it necessary to suppose, that all the *extinct* races of large animals, found in diluvium, were destroyed at the deluge? If the account of the animals that were preserved in the ark, is to be understood so strictly as to include *every genus* and *every species*, then we need make no other variation in our conclusions, than that, while all the animals, except a few individuals, of each species, perished in the deluge; and therefore, their remains may be naturally found in ancient diluvium; *some* genera and species, of which the representatives were preserved in the ark, with the other animals, have perished since, by unknown causes, so that their races have disappeared entirely from the earth. There can be no objection to this admission—it does not weaken, at all, our view of the peculiar and destroying effects of the deluge. While we make this remark, we must not however forget, that the fish are not mentioned in the history of the deluge. The obvious answer to this, is, that being tenants of the waters, they might well be left to take care of themselves.

Whatever difficulties may arise, from the universal prevalence of a stormy, agitated ocean, (at least stormy and agitated during its rise, although comparatively pacific after it had attained its height, and during its decline,) an ocean filled with the wreck of the surface, turbid with mud, and unfriendly to the preservation, even of fishes, especially, as they include the species, both of salt and fresh water, and therefore of widely different habits: we may suppose, that a few might still escape destruction, and thus preserve the races, although the greater number evidently perished, along with the land animals. As might be expected, therefore, we find the skeletons of large fishes, (whales, sharks, &c.) buried in ancient diluvium, or grounded on high mountains, especially where cold and ice have aided in preserving the remains from decomposition.

Preservation of Vegetables.

Without supposing that the ark was a green house, or a repository of antideluvian seeds, it would perhaps not appear incredible, that Noah, so long warned of the approaching catastrophe, which was to tear away the soil, and root up the forests by the force of rushing waters, should have preserved some of the more important esculent plants and seeds; a degree of care not exceeding that which is exercised by every leader of a colony, when passing over seas to a new abode. But, however this may have been, there is no serious difficulty in believing, that in an ocean, which, from its magnitude and depth, was probably never warmed to that degree that favors germination, or vegetable decomposition: seeds of almost every kind may have floated, uninjured, during the short period of a year, (for we know that seeds and seed vessels, are actually floated from continent to continent, without losing their germinating powers,) and when the water subsided they would of course, at least those that were in favorable circumstances, again shoot and grow.

We know also that seeds lie uninjured in the earth for many years, for every movement of the soil in cultivation is sure, after a little repose, to bring up a new crop of plants, and successive crops spring up spontaneously, on the same ground, even when left untilled from year to year.

It is obvious, also, that the roots of plants and trees, would again strike into the ground and vegetate anew, as soon as the waters were sufficiently withdrawn, and the kindly influence of the sun was felt.

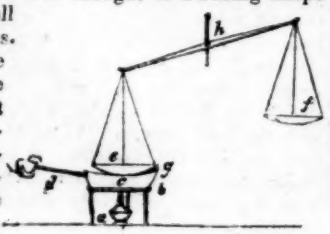
There seems therefore no serious difficulty in the restoration of vegetation to the earth, after the deluge.

The loose materials by which the surface was covered, were a mixture of all preceding soils, and therefore fitted for the immediate renewal of vegetation. Horticulture and agriculture, especially the cultivation of the vine, (which needs little besides sand, and sun, and moisture, to make it grow,) might therefore have been resumed immediately. As vegetation increased, the soil would of course improve in fertility, by a natural process of manuring.—*Siliman's Geology.*

[From Louden's Magazine.]

ART. LXXIII.—*Outlines of Horticultural Chemistry—Diseases of Plants.* By G. W. JOHNSON, Esq., Great Totham, Essex. [Continued from Vol. 2.]

The following sketch *(fig.)* represents the apparatus I have found the best for ascertaining the retentive power of soils. *a* represents a small lamp; *b*, a tripod for supporting a small tin vessel *c*, which has a small hole and plug at *g*, for the purpose of filling it with water; and a small pipe *d*, for the escape of the steam when the water is brought to a boiling temperature; *h* is a small pair of grain scales. To ascertain the moisture retentive power of a soil, put 10 grains of it, previously dried by exposure to a temperature of 212° (the boiling point of water,) for half an hour, by having it laid upon *c*, whilst the water within it is kept boiling for that period. On the 10 grains of previously dried soil, put, by means of a small quill, three drops of clean water; ascertain the exact weight of these, usually 4 grains; then suspend the beam, so that the pan of the scales containing the soil may rest upon *c*, as represented in the sketch, the weight of the water having previously been removed from the other scale-pan *f*. The water in *c* must be kept boiling, and the exact number of minutes noted that is required to evaporate the added moisture, so as to return the beam into equilibrium. It was by means of this apparatus that I obtained the comparative results detailed in a former volume. I have always found those soils proportionably unproductive, the first from containing too much alumina, and the second from a redundancy of silica, as they required more than fifty minutes, and less than twenty-five minutes, to deprive them of half their weight of moisture.



I shall now proceed to consider some of the diseases of plants, whose ravages affect the horticulturist, and on which science may afford some light. Plants being organized bodies, whose parts, in the common course of nature, are subject to waste and decay, the functions of these are consequently liable to disarrangement, and such disarrangement constitutes disease. Such morbid affections are not, however, always the consequences of old age: they are often caused by matters being absorbed from the soil which are inimical to the constitution of the plant; from a want of those that are beneficial, as well as from their excess; from violent and sudden transitions of temperature; from wounds, and from the attacks of vermin.

"Animals," said the late Dr. Good, "are liable, as we all know, to a great variety of diseases; so too, are vegetables, to diseases as numerous, as varied, and as fatal; to diseases epidemic, endemic, sporadic; to scabies, pernio, ulcer, gangrene; to polysarcia, atrophy, and invermination. Whatever, in fine, be the system of nosology to which we are attached, it is impossible for us to put our hand upon any one class or order of diseases which they describe, without putting our hand, at the same time, upon some disease to which plants are subject in common with animals."

In previous communications upon the food and climate of plants, I have made a general statement of what may be termed their *dietetics*, in a treatise on vegetable pathology; and, as a due attention to those points is the best prevention of their diseases, I shall confine myself from any general remarks on that point, and to the specific diagnosis, prognosis, and treatment of such disorders as I may mention.

Canker, Ulcer. These are synonyms of the same disease, which is accompanied with different symptoms, according to the species of tree in which it occurs; being known as the canker in those whose true sap contains a more than usual proportion of acid; and as ulcer in those containing tannin, or other astringent principle. In both it is an ulcerous affection.

The symptoms vary in the genus Pyrus, and others whose sap contains a free acid. It is seldom, if ever, accompanied by a discharge; but the parts affected enlarge, their wood becomes brown and carious, and the bark covering them cracks, gapes, and manifests a disposition to separate from the wood.

In the genera Ulmus, Quercus, and others abounding in astringent matters, a copious discharge usually accompanies all the preceding symptoms, which are

always present also, with the exception of the swelling of the parts, which only occasionally occurs. The discharged liquid is occasionally transparent; but generally a reddish brown, becoming nearly black by exposure to the air. The sides of the ulcer in the first instance, are usually covered with a white, crystalline incrustation; in the second, with a shining, varnish-like coat. In the genus Prunus, and others abounding with gum, the same symptoms are exhibited, except that swelling still more rarely occurs, and that the discharged matter is nearly pure gum, a variation which seems to remove it to another class of diseases.

In every instance, I am prepared to maintain that the disease is local; that is, it at first arises from a disarrangement in the functions of the affected part, and is never brought on from a general diseased state of the tree; but is occasioned by contingencies perfectly independent of soil and situation. When the disease has commenced, if these are unfavorable, they may aggravate the symptoms, and promote their diffusion, but they are not the originators of the disease.

It appears to me, in general, to arise from contused wounds, however they may be inflicted; by the bruise occasioned by a blow, or the erosion by a ladder, or the contact of two branches. The wounds in such cases, as in the animal frame, are long in healing; the extravasated sap and contused vessels speedily decompose: and how this spreads by contact, in all organized bodies, is too well known to need to be here insisted upon.

The complete removal of the affected part by the knife, and then covering the wound by a plaster to exclude the air, is the best remedy; and if, from long neglect, it has been allowed to spread itself from branch to branch, until the whole tree has become infected, remedies are then of no avail, and the tree had better be removed.

The chemical phenomena of the disease appear to be the complete decomposition of the vegetable fibre, which passes off in the form of carbonic acid and carburetted hydrogen gases, whilst the friable matter which remains behind consists of some foreign vegetable principle, the result of decomposition, and an excess of saline and alkaline matters.

Vauquelin analysed the sanious discharge from an elm, and found in it nearly 40 per cent. of alkaline and saline constituents, which is about three times as much as the sap contains when in a healthy state, if compared with the amount of its vegetable constituents. Then, again, the saline matter in the sap of the elm consists chiefly of acetate of potash and carbonate of lime: those in the sanious discharge, of carbonate of potash and carbonate of lime. Decomposition has here, therefore, been effected as well as in the carbonaceous matter of the tree: a decomposition, too, aggravating the disease; for woody matter, macerated for some time in a solution of carbonate of potash, is decomposed and converted into ulmin: and that this effect is produced in the progress of the disease was demonstrated by Vauquelin, who found that the brown matter discharged by the elm consisted of ulmin and carbonate of potash.

Sir Humphrey Davy detected carbonate of lime on the edges of the cankered parts of apple trees. The above facts demonstrate, that an excess of alkaline matters occurs in vegetable ulcerations; and, guided by this, the last-named chemist recommended diluted acids to be applied to the wounds, and even poured about the roots, in case the tree is of sufficient value. The topical application would doubtless check the corrosion of the ulcer; but it admits of doubt whether the administering an acid to the roots would be of benefit, unless it were one that is not with facility decomposed, as the sulphuric, or muriatic: for, previously to arriving at the wound, it would have to be elaborated in organ which no vegetable acid, as the acetic or tartaric, would pass through unchanged. Muriatic acid I should recommend to be employed; for, even if decomposed, the result would be compounds that may be applied to ulcerous affections with advantage. To the wound it should be applied, after being mixed with twice its bulk of water; and to the roots, after an ounce has been mixed with a gallon of water: applied twice a week.

It must not be neglected to be observed, that if old trees become affected with this disease, there is little chance of preserving them; for the sap of old trees always contains less of vegetable, and more of saline, matter, than when they are young and vigorous; consequently, they are more prone to the disease.

"The old age of a tree," says Davy, "in this respect, is faintly analagous to the old age of animals, in which the secretions of bony matter are always in excess, and the tendency to ossification, great."

It is a very mistaken idea of some gardeners, that trees affected with canker are benefited by having the earth removed from around their roots, and the space refilled with sand: on the contrary, if the old soil is removed, it should be replaced by that which is fresh and fertile; at all events, a little well putrefied dung should be pointed in round the stem, and the surface kept covered with mulch during the summer, to prevent them being injured by drought. In short, every thing should be done to keep them in vigour.

(*To be Continued.*)

[From Louden's Magazine.]

ART. LXXIV.—*On a System of pruning, or rather on a Preventive System of pruning Forest Trees.* By Mr. W. BILLINGTON, M. C. H. S., Author of *Facts and Experiments on Oaks*, &c. &c.

SIR,—May I beg the favor of you to give publicity to the following observations and remarks on the most important part of arboriculture, viz. the act of pruning forest trees, or rather, what should be termed a preventive system of pruning, in your Magazine.

Having had considerable experience in the raising of young plantations of oaks for future navies, in some of the royal forests, and having often seen the ill effects of the erroneous methods generally adopted in pruning forest trees, or, what is as bad, of its too frequent neglect, I incidentally recommended the shortening or cutting in of from one third to two thirds off the extremities of the branches of some larch trees, to give *light* and room to the young oaks which were nearly destroyed by the larches and other overgrowing and shading stuff. On this account I was accused, by a superior officer, and others of *supposed* superior skill and knowledge, of having spoiled the larches by such cutting (mind, reader, when they were in full leaf,) they asserting that it would bleed them to *death* at the end of the season; and when it was found that they

had not bled to *death*, but had improved greatly in health and vigor, to prove me wrong, it was as confidently asserted by the same knowing ones that it had *injured* them, by drawing the sap out of the stem into the branches. Such was the knowledge or motives of a *superior officer* and others. Not thinking it worth while to contradict such knowing ones by stating what others said or thought about it, being convinced of its absurdity, and of their motives for opposition; and although the cutting of the side branches from the stems of trees at an early age had been recommended by a writer (Pontey) who was considered good authority, as tending to increase the timber in the trunk or stem; I set to work immediately to prove by experiments whether it tended to increase or retard the growth of the stem, and soon found the wonderful advantage it gave to the trees of whatever kind, as to vigour and increasing the bulk and handsomeness of the stem. I drew up a table of my experiments under the different modes that I tried, which clearly shows the superiority of my system, and the extremely injurious tendency of the other; this I published, for the information of the public, in a book, in which the process and results are amply and clearly detailed, with a view, if possible, of stopping or checking that widely extended pernicious system of divesting young trees of their side branches.

Since the publication of that work, the public attention has been considerably excited on the mode adopted for planting the royal forests, regarding which, blame has attached where it ought not, but on that subject I intend to explain at a future time; and likewise upon the after-management and pruning of the *young trees*, which is, above all others, of more paramount and lasting consequence, than the mere planting of the trees by any system. Having discovered and proved it by my own experiments, I disclosed to the British public the gross error of that system of pruning, by cutting off the side branches from young trees, and the vast superiority of my system of shortening, or cutting in, the branches, whereby the number of branches are increased, and their tendency to increase in thickness greatly diminished, with the quicker increase of the stem as it respects thickness, length, regular tapering, and superior quality of the timber, as I have clearly pointed out in my publication.

As my ideas are now more mature and confirmed on that most important part of the art termed pruning, but which I think would be better termed a preventive from pruning, I beg to offer a few more remarks on it, hoping to call the attention of every lover of woods and planter of trees to the subject; for, without that *after-management*, they will generally find themselves sorely disappointed in various points of view. My method I shall take the liberty, in imitation of a recent writer on planting, who appears fond of introducing new terms, to call the *Billingtonian System* of pruning, training, &c., a name which has been applied to it by a great lover of trees, planting, and rural life, who much admires and appreciates the system.

The advantages to be derived from it, if properly understood and practised, being incalculable, I will not attempt to describe them, but endeavor, in as concise and clear a manner as possible, to explain the mode by which such advantages may be derived, and refer those who wish to be more minutely informed on the subject to my work, where every process to obtain such great results are clearly detailed, and at greater length than the present paper will allow.

First, then, we must begin with the plants in the nursery at an early age, when they have made a few shoots; some of them will be stronger than others, and two often of nearly an equal size. After the shoots have grown a foot or two, more or less, according to the kind of tree and other circumstances, break out the central or terminal bud; pinch off part of the last or present years terminal shoot, or cut it off if it is too old or tough to pinch off with the finger and thumb; the strongest horizontal side shoots must be shortened, and prevented from extending too far, by the above method; and the more upright and strong shoots, that are competing with the leader, must be cut in rather shorter, to cause them to throw out more smaller branches, as the strongest and most upright shoots must always be left uncut for the leader to form the stem of the future tree.

This work must be followed up through every summer while in the nursery, and after they have been planted out and begun to make vigorous shoots; for summer is the best time to do it: and twice through the summer would be much better, as some kinds of plants make too vigorous shoots in the growing season; first time about June, second time in August or September.

These are the properest seasons for shortening the branches; and as it is such an easy and delightful employment, and the seasons so pleasant, I do earnestly hope the fair sex will be induced to study and learn the art, when they may spend many a pleasant hour in healthful and really profitable employment, either alone, or with their spouses or brothers, in imitation of our first parents, when in their state of innocence in the plantations and gardens of Eden; how worthy to be imitated! but I beg pardon, I am digressing from the main subject.

By following up this system with the plants from their infancy, we procure numerous small branches with buds and leaves, whereby the trees are supplied with nutriment for their support, and the increase of the stem; the quality of the timber is improved by the more numerous elongations from the buds of the young shoots and branches that descend longitudinally down the stem; for, as the branches increase, so do the roots; and, *vice versa*, if the branches be few and straggling, so will the roots. If there is no unnatural cause to destroy the branches, then by following up this simple and easy process, from 10 to 15 or 20 years, according to circumstances, we may raise the stem of a tree to any height that may be desirable, before it is permitted to branch out in all its native beauty and wildness; or we may dispose its future form to any use or in any way fancy or taste may dictate, as I have fully explained in my publication. At the same time, those branches that have been shortened, and prevented from being extended, or "cut in" (if that should be thought a more appropriate term,) when young, are rendered, by that simple and easy operation, unable to acquire that degree of thickness which would injure the quality of the future timber when converted to use; as there would be none of those great knots which are so unsightly and often injurious when timber is worked up for cabinet or other purposes. Those small branches, besides contributing so materially to the increase of the stem, roots and quality of the timber, &c., render it more hardy, and fitter for more open and exposed situations, if it should be desirable to transplant

any of them from where they may be too thick, instead of cutting them down, or, what is more likely to happen, when they become more exposed by thinning, especially where fir trees are removed. By this system, the trees acquire a strength of stem and roots in proportion to their tops, and also a hardiness to enable them to stand the cold and stormy winds.

[From the British Farmer's Magazine.]

ART. LXXV.—REVIEW *of a Letter to Sir Henry Steuart, Bart. on the Improvement in the Quality of Timber, to be effected by the high Cultivation and quick Growth of Forest Trees, in reply to certain Passages in his "Planter's Guide."* By W. Withers, Esq. Longman, 1829.

Planting Forest Trees is one of the most important objects in rural economy, whether it be regarded as a public or private concern. Productive of ornament to a country, pleasure and profit to the proprietor, it has been and continues to be executed in many different ways; from the simple fact of only fencing off cattle, up to the expensive operation of removing groves from one place to another. Whether we view the woods raised by unassisted nature, or those reared by art, we invariably see the most stately trees on the most suitable soils. Different kinds affect different soils and habitats. While the willow, alder, and poplar luxuriate on the humid border of the marsh or river, the pine and beech on dry heights, we see the oak, and elm, and ash, arrive at the greatest magnitude in the shortest time on the richer depths of loamy slopes. These indications are the planter's guide. He adopts nature's principles in the disposition and choice of his kinds, adding every means of cultivation to ensure success. If his ground be too wet, he drains; if foul with worthless plants, he grubs; if too thin, and firmly bound together, he digs, ploughs, or trenches: and whether he sows or plants, he protects by fences, and guards from smothering weeds. This is the usual procedure of the planter; it is the long established practice every where; and the success is always commensurate with the degree of preparation made, the care and skill bestowed in execution, but most of all on the natural fitness of the soil.

Except in nurseries or in parks, where a group of trees was particularly and quickly wanted, assisting forest trees by manure, has not, till within these few years, been deemed necessary. Some late writers, Griesenthwaite, for instance, held that manuring forest trees was as rational and necessary as manuring any other cultivated plant. But it has been reserved for the author of the letter before us to take up this improvement in planting with extraordinary zeal; and having witnessed its effects on his own plantations, so convinced was he of its great importance to planters generally—national as well as private—that he wrote and presented a statement of his method and its results to the Society of Arts; and in subsequent publications has not only shown how wonderfully his trees succeed with such management, but proves, by fair calculation, that his plan is, before all others, the *most economical.*

On the first publication of Mr. Withers's practice, no one at all acquainted with the subject for a moment doubted his report of the results attributed to it. It was impossible to disparage his practice, refute his arguments, challenge his calculations, or find fault with his comparisons. The *Expense**—the first great expense—was the *only* obstacle which staggered and dismayed even his converts! And though he pointed out the absurdity of those planters who "went the nearest way to work," and only met, from their half-measures, loss and disappointment, still his advice was received with a languid calculating coolness which it really does not deserve, as his own plantations fully testify.

In this stage of public feeling, a celebrated reviewer threw a damper on Mr. Withers's opinions and practice, by merely pointing to the fine woods planted, as one of Mr. W.'s friends says, "by the hand of Providence," to the magnificent groves of pines in the North of Europe and America, the gigantic forests of the tropical regions, and to the noble woods of oak and beech which enrich and adorn so many parts of the British isles: all these have received no assistance from the hand of man. And besides, how many stately woods are now in vigorous existence in this country which were planted on a single ploughing, digging, trenching, or even by the despicable mode of "holing," without manure, or other care or expense save fencing? All this is very true, but inapplicable; because Mr. Withers replies by another question, viz. what would these woods have been now, and how much sooner would they have attained maturity had they been treated according to my plan? Unluckily, his reviewer added, also, that early pampering a tree has only a temporary effect—it sends up the stripling in great vigour, but is lost on the full-grown tree.

Mr. Withers answered this attack of the reviewer in rather keen terms; but scarcely had he done so, when another objection was made to the manuring system, viz. that pampered and quick grown timber is inferior in quality, and unfit for naval purposes. This last objection has called forth the present letter; and on the whole of it we are bound to say, he has defended himself and system most successfully—not by counter assertions, or arguments drawn from his own experience or stock of phytological knowledge, but by actually turning the artillery of his antagonists against themselves, and not without considerable effect.

To strengthen his position, he enlists every auxiliary he can muster, who all, more or less, assist to make out rather a strong case. We may remark here, and we do it as a compliment to Mr. Withers's perfect candour, that one of his authorities, No. 16, like Balaam the Prophet, has done exactly contrary to what was, perhaps, expected of him, viz. declaring his belief that slow growed timber on exposed situations is more solid and durable than that of quick growth from sheltered spots. This is, in fact, the foundation of the objections to timber of rapid growth; and here we may observe, also, to save recurring to this part of the subject again, that this is the ground taken by Sir Henry Steuart, and if an error, is a very popular one; for except carpenters; (who, by the bye, are likely to be the best judges,) nine out of every ten in the kingdom would decide against quick growed timber, merely from the *plausibility* of the thing. From the number and respectability of the evidence against this idea, however, there is really no contending, unless the collective opinion can be explained away, by showing that they have substituted *toughness* for durability—two properties of timber which are quite distinct, and

* £16 per acre, ($72.)

should be considered apart in such discussions: but of this hereafter.

From what has been already observed, it will be understood that the question at issue between Sir Henry Steuart and Mr. Withers, is, whether oak or timber raised on rich and highly cultivated land be or be not inferior in quality to that grown on a poor uncultivated soil?

Mr. Withers has submitted this question to a number of persons conversant in planting, land agents, timber dealers, and particularly to officers connected with the navy yards. From these he has got together a mass of valuable information generally favorable to his manuring system.

Many of the answers, it is evident, are only founded on the circumstance, that as straight, clear grained, free growed timber, being easily convertible, whether for common or naval purposes, being most saleable, and bearing a higher price, is necessarily the best, without reference to its durability. One reporter thinks that oak cannot grow too fast, provided it is allowed to stand its time. One answers the question chemically, others physiologically, mechanically, &c.

It is impossible to condense all this evidence so as to make it bear directly on the question. It will be necessary, therefore, that, instead of giving a list of opinions, to give a plain description of the growth of the oak, the manner of its accretion, different appearances and properties while young, aged, and when going to decay. This will enable our readers to judge for themselves, without being implicitly led by either persons or opinions.

The first shoot from the acron consists of one layer of bark, and one cylinder of alburnum, or white wood, surrounding the pith. In the second year, on making a cross section of the infant stem, we find two layers of bark, the second formed within the first; two circular layers of white wood, the last being formed on the outside of the first; the pith maintaining its place, but somewhat less in diameter. This is the manner of the accretion in all succeeding years; so that an oak tree one hundred years old is covered with one hundred layers of bark, and is composed of one hundred layers or rings of wood.

This is the process of the enlargement of the butt or stem of the tree; and at whatever period it may be felled within the ordinary age, it will be seen to be composed of a congeries of concentric layers of ligneous matter; the exterior or last formed one embracing all the others. Here we see a *whole* made up of annual *parts*, both of which must be considered separately.

The solidity, ponderosity, and, perhaps, the durability, of the whole, depends on the presence or absence of those qualities in the parts. If we examine these parts, we find they are composed of a body of fibrous matter ranged perpendicularly or longitudionally from the root to the summit. This fibrous tissue is of unequal texture, the inner side being more vascular, as it contains the larger sap vessels; the outer side is more solid, approaching, in consistence, to a membranous quality, and of the same nature, as are the divergent partitions (commonly called rays) which cross from the centre to the circumference of the bole, and which appear to connect the mass of parts together. Both the divisions of the annual layer are thicker or thinner, according to the favorableness of the season, the soil, or situation; in other words, according to the vigour of the tree. Mr. Knight, President of the Horticultural Society, in his answer to Lord Glenbervie, is made to say, "a layer of very porous wood marks the commencement of each year's growth; and when the growth is small, these porous layers *touch* each other." It has escaped the worthy president, that this argument tells both ways, because "when the growth is small," there are as great a number of solid membranous as there are porous divisions in each layer; and these (the membranous) certainly form the most durable parts of the timber, as may be seen when oak, or indeed any other sort of timber, is in the act of decomposition. That the porous divisions "touch each other," is seldom seen, and cannot possibly happen except when the spring growth is checked *instantaneously*, and no gradual autumnal decline takes place, which is very seldom, if ever, the case.

As oak is the most durable of British timber, so it is one of the latest in coming to what carpenters call *heart*, or perfect timber. The first formed cylinder of alburnum does not become heart, or perfect, till about the *sixth* year; so that there are always, in every year of its age, five layers or cylinders of white wood forming the exterior of the stem, next the bark. These exterior layers are called by woodmen the sap of the tree, and are usually slabbed off. It is for this reason that oak stakes or poles, of less than six years' growth, are the least durable of any other kind of tree. Every layer of wood becomes perfect in succession from the centre outwards, and then changes from a white to a brown colour. The slightest inspection of a tranverse section of a felled tree, of whatever size or age, will confirm all this. Here it may be necessary to observe, as a caution to the observer of these annual accretions of the trunk, lest he deceive himself in endeavouring to ascertain the age of an oak, by counting the number of concentric rings composing the stem: some of these rings appear to be twins, as if one year's growth had been formed at twice; this is attributed to the well-known circumstance of the oak making two shoots in a season, viz. the spring and the midsummer shoots. The experienced eye, however, easily detects this irregularity in the grain.

As the timber is only an excremental part of a tree, its duration is temporary. The first-formed cylinder of wood, which contained the pith, is the first to decay. The year next before this commencement of dissolution, is the period of ultimate perfection. If the tree be felled before this date, a part of its volume is *lost*; if after the decay has begun, it falls defective. Whether the first-formed cylinder of wood of all oak trees begins to decay at the same distance of time, is an important question, and probably not yet ascertained. It appears that so long as the first-formed cylinders of timber, though long ago deserted by the vitality of the tree, continue to act as sap-conductors of the system, they remain sound; but when no longer necessary for this purpose, they lose the mutual adhesion of the ligneous fibre, lose their tenacity, in short, become decomposed. This is the state of a tree, when its interior has become what woodmen call "doated," and what our friend, Mr. Trumper, in his letter to Mr. Withers, calls "red-hearted."

The utmost limit of soundness of the first cylinder is an essential point in phytology, could it be fixed so as to be practically useful. It would settle Mr. Wither's question at once; because if an oak tree has only a destined number of years to arrive at perfec-

tion, the greater magnitude it can be brought to within that period by cultivation, the greater would be the profit to the planter. An oak lives much longer after it has arrived at its carpenter's perfection than before. Indeed, did it not fall under its own weight and the war of elements, it would live for ever.

When, however, the heart begins to decay, the defect gradually extends outwards; and for every layer of white wood formed on the exterior, another becomes useless and doated interiorly. This is the progress of decay; and though the intermediate part of the stem be sound, it at last becomes a mere shell, and totters to its final fall.

Now it does not appear that the ligneous rings formed by a slow growing tree, attain perfection either sooner or later than a vigorous one. These parts of both are composed of the *same kind of material;* only the former, under the action of the plane, appears of a finer and milder grain than the latter. All the parts of a luxuriant vegetable are individually of greater magnitude than those of a stinted one; in course the fibres of the strong grower are larger than those of the weaker. Hence their greater tenacity; but whether, also, of greater durability, is, from what has yet been stated, still questionable. In macerating a chip of perfect oak timber, the homogeneous mass of cement which connects the fibres together, is first dissolved, leaving the ligneous fibres naked, and visibly arranged as they were in the growth; those of the weak growing tree are more attenuated than the more rampant growth, but they are *closer together;* and hence the question—is it likely that a compact compages of small fibres is less durable than a body of larger fibres at greater distances? But there are other questions very material to be solved, viz —what is the nature of this cement—is it gummous and permanent, or aqueous and fugitive? It is prepared by the tree itself. Does its quantity or quality add to the durability of the timber? It is gummous and permanent; the timber is sound when present, whether while growing or after it is put to use—unsound when it is wanting, or when dissolved or evaporated away. If, then, this cement adds to the durability, as we know it does to the ponderosity of the timber, we must infer that the tree most replete with this component is the most perfect in every respect; and then the conclusion follows, that the tree, situated where it can supply itself with this ingredient of its constitution, will be the best timber; and this must be where it soonest arrives at the greatest perfection. Another thing must be mentioned: all trees, according to the wetness or dryness of their station, are more or less charged with aqueous sap, and which is exhaled away after they are felled: the free growing tree in course requires more seasoning than one felled off a dry hill.

This is the natural history of the growth and decay of the oak tree. But there appears nothing in this account to show whether slow or quick growth of the same age forms the most durable timber. The "gentleman of great scientific knowledge," quoted at pp. 46, 47, states, that "oak of warmer climates is superior to that of colder"—a fact we were not before aware of, having always understood that English oak surpassed that grown in any other country. But the quotation from the same, which immediately follows, is manifestly mis-stated. He observes,—"If you look at the progress an oak has made in one year, it *will be solid;* but *between* each year's growth there is a porous space, the more frequent recurrence of which in a given piece of timber (which will be the consequence of poor soil) must necessarily lessen the quantity of solid wood." Now, no one-year's growth is ever entirely solid; the porous space is not between, but part of each year's growth; it is the produce of the three first months of spring, containing the principal expanding vessels, and is bounded by the more solid produce of the autumn: so that the solidity, in all cases, is equal to the porous portions of the growth.

The opinion of timber-dealers has no weight on the question; because they look to that only which is most marketable. Fine, free-growed, handsome sticks, is their object and sign of excellence. The time has been, when planters proposed to grow compass-timber for the navy. "Grow us straight timber," said the shipwrights, "we always have compass-timber enough, or can bend clean-grained timber to our purposes." Cross-grained stuff, however, is sometimes desirable where there is much strain and danger of splitting. The "unwedgeable and gnarled oak" is proverbial for its toughness and durability; but this is seldom produced by free growth.

Several of the timber-dealers think that a free growing tree may be felled too soon; that after rising into size, it should be allowed to stand to attain maturity: thus weakening their own argument by shifting the superiority from quick growth to age.

The opinion of the author of "The Domestic Gardener's Manual" is quoted to show the use of manuring trees. This writer is a horticultural as well as a chemical luminary, lately burst upon us. He reveals "primary causes, and looks into the first principles of created things." As far as gardening, and in course agriculture, can be assisted by chemistry, this profound writer promises to apply it. If he will but study vegetable physiology as intensely as he has studied chemistry, we hope to see him exploding, instead of explaining, the incomprehensibilities of M. Dutrochet.

G. W. Johnson, Esq. thinks the best timber is produced under circumstances of mediocrity, i. e. where it is neither forced into premature bulk, or starved in consequence of a misdirection of vegetable energy.

With respect to the trials made at Woolwich, it must strike every one that they are only tests of the toughness, not of the durability, of the timber. Without denying that such tests also indicate durability, we must say, that in such an investigation these properties should have been considered separately. The first is proved mechanically; cannot the second be proved chemically? Surely, such a gentleman as the author of "The Domestic Gardener's Manual" could invent a menstruum for this purpose. But this aside. It is well known that there are several sorts of timber as lasting as oak, and under such a trial would have snapped like glass with only one-third of the weight. It is not clear but that the ash of which spokes were made, by the intelligent gentleman, (No. II.) would not have carried as great a weight (though with more deflection) as the oak; but this would be no proof of its equal durability. Some kinds of wood, from their specific gravity, do not swim; but easily frangible, though wonderfully durable. The most durable pieces of oak are chosen for pins in framing; such, for instance, as has been long seasoned in old buildings; but this is so exceedingly fragile that it is driven with difficulty.

On the whole, we must say, what is universally

known, that the most perfect timber is that which is felled while it is in its prime, *i. e.* when the entire tree is in full vigour. The oak of the rich vale, and that of the gravelly hill, if felled at the *same age*, will differ very little in quality if equal pieces of the sound heart be compared. But the former rising rapidly into fine form and size, is sooner fit for the axe; and if compared with trees of the *same size* produced on the hill, and which are necessarily twice their age, will be found superior, as well in weight as toughness.

Among the opinions collected by Mr. Withers, there is only one that entirely agrees with Sir H. Steuart. Several approve of quick growth, but think (without giving reasons) that mature age is necessary. The greater number decide against Sir Henry; and as their convictions are founded on practical results, rather than on the ambiguous principles of physiological knowledge, as now taught, are more to be depended on in answering a question which long experience only can determine.

We think, therefore, that Mr. Withers has fully made out his case; and whether quality or quantity be the planter's object, it must be conceded to him, that his mode of preparing, planting, and after-management of the ground, is certainly the most efficacious.

[In No. 3, page 32, the name *Barton* was misprinted for *Bartram*. We take this opportunity to thank our correspondent for the pains he takes in pointing out misprints. At the end of the volume we shall notice the corrections.]

[For the N. York Farmer.]

ART. LXXVI.—WILSON'S ORNITHOLOGY.—*The King-bird, and the purple Martin.* [Continued from page 52.]

The design of these ornithological notices, is to make our farmers and gardeners *better acquainted with their feathered* FRIENDS.* None names the wren, the blue-bird, the barn swallow, and some others, without kind feelings; and the robin, although he visits the cherry tree and the currant bush, is welcome at any *other* season. There are birds, however, whose services are as eminent as these, whom I fear we treat with injustice and even cruelty, because the indulgence of their taste slightly interferes with the indulgence of ours.

Without inquiring whether birds have any rights? or whether all right is founded on power? I appeal at once to the good sense of the cultivator, strong in the hope that he will not persevere in a course discountenanced both by self-interest and benevolence; but that he will at least calculate the benefits as well as the injury which he receives from birds; and as it is supposed that *resentment* is a stronger impulse than *gratitude*, that he will, on this score, deliberately and properly make the necessary corrections.

The birds selected for *this number of the New-York Farmer*, are charged with the same vice, that of *eating bees*. I know not that they interfere in any other manner to the injury of our rural economy; neither, of all our domestic animals, do I know one whose trespasses, at times, we do not sensibly feel, and yet forgive.

* See note to the Editor, Vol. 2, No. 12.

THE KING-BIRD.

"The trivial name *king*, as well as *tyrant*," says WILSON, "has been bestowed on this bird for its extraordinary behaviour, and the authority it assumes over all others, during the time of breeding. At that season his extreme affection for his mate, and for his nest and young, makes him suspicious of every bird that happens to pass near his residence, so that he attacks without discrimination every intruder. In the months of May, June, and part of July, his life is one continued scene of broils and battles, in which, however, he generally comes off conqueror. Hawks and crows, the bald eagle, and the great black eagle, all equally dread a rencontre with this dauntless little champion, who, as soon as he perceives one of these last approaching, launches into the air to meet him, mounts above him, and darts down on his back, sometimes fixing there to the great annoyance of his sovereign, who, if no convenient retreat or resting place be near, endeavors by various evolutions to rid himself of his merciless adversary. But the *King-bird* is not so easily dismounted. He teases the eagle incessantly, sweeps upon him from right and left: remounts that he may descend on his back with greater violence; all the time keeping up a shrill and rapid twittering; and continuing the attack, sometimes for more than a mile, till he is relieved by some other of his tribe, equally eager for the contest.

"There is one bird, however, which, by its superior rapidity of flight, is sometimes more than a match for him; and I have several times witnessed his precipitate retreat. This is *the purple martin*, one whose food and disposition are similar to his own; but who has greatly the advantage on the wing, in eluding all his attacks, and teasing him as he pleases. I have also seen the red-headed woodpecker, while clinging on a rail of the fence, amuse himself with the virulence of *the king-bird*, and play *bo-peep* with him round the rail, while the latter, highly irritated, made every attempt as he swept from side to side to strike him, but in vain. All this turbulence, however, vanishes as soon as his young are able to shift for themselves; and he is then as mild and peaceable as any other bird.

"The *king-bird* is altogether destitute of song, having only a shrill twitter. His usual mode of flight is singular. The vibrations of his broad wings, as he moves slowly over the fields, resemble those of a hawk; and the object of the king-bird is no doubt something similar, viz. to look out for passing *insects*, either in the air, or among the blossoms below him. In fields of pasture he often takes his stand, on the tops of the mullein, near the cattle, and makes occasional sweeps particularly after *the large black gad fly, so terrifying to horses and cattle*. His eye moves restlessly around him, traces the flight of an insect for a moment, then that of a second, and even a third, until he perceives one to his liking, when with a shrill sweep he pursues, seizes it, and returns to the same spot again, to look out for more. This habit is so conspicuous when he is watching the bee hives, that several intelligent farmers are of opinion that *he picks out only the drones and never injures the bees*. Be this as it may, he certainly gives a preference to one bee, and one kind of insect over another. He hovers over the river, sometimes for a considerable time, darting after *insects* that frequent such places, and diving about in the air like a swallow.

"Whatever antipathy may prevail against him for depredations on the drones, or if you will on the bees, I can assure the cultivator, that *this bird is greatly his friend in destroying multitudes of insects* whose larvæ prey on the harvests of his fields, particularly his corn, fruit trees, cucumbers, and pumpkins. *These noxious insects are the daily food of this bird; and he destroys some hundreds of them daily.* The death of every *king-bird* is therefore an actual loss to the farmer by multiplying the numbers of destructive insects; and encouraging the depredations of *crows*, *hawks*, and *eagles*, who avoid as much as possible his immediate vicinity."

THE PURPLE MARTIN.

"The summer residence of this agreeable bird is universally among the habitations of man. Wherever he comes, he finds some hospitable retreat fitted up for his accommodation, either in the projecting wooden cornice on the top of the roof or sign post—in the box appropriated to the blue-bird; or if all these be wanting, in the dove-house among the pigeons. In this last case, he sometimes takes possession of one quarter, in which not a pigeon dare for a moment set its foot. Some people have large conveniencies formed for *the martin*, with many apartments, which are usually fully tenanted and occupied regularly every spring. Even the solitary Indian seems to have a particular respect for this bird. The Choctaws and Chickasaws cut off all the top branches from a sapling near their cabins, leaving its prongs a foot or two in length, on each of which they hang a gourd, or calabash, properly hollowed out for their convenience. On the banks of the Mississippi, the negroes stick up long canes, with the same kind of apartment fixed to their tops, in which *the martins* regularly breed. Wherever I have travelled in this country I have seen with pleasure the hospitality of the inhabitants to this favorite bird.

"I beg leave to introduce in this place an extract of a letter from the late learned and venerable John Joseph Henry, Esq., Judge of the Supreme Court of Pennsylvania, a man of most amiable manners, which was written to me but a few months before his death, and with which I am happy to honor my performance.

"'In 1800 I removed from Lancaster to a farm a few miles above Harrisburgh. ☞ *Knowing the benefit derivable to a farmer from the neighborhood of* THE MARTIN *in preventing the depredations of the bald eagle, the hawks, and even the crows*, my carpenter was employed to form a large box with a number of apartments for *the martin*. The box was put up in the Autumn. About the middle of February the blue-birds came; in a short time they were very familiar, and took possession of the box; these consisted of two or three pairs. By the fifteenth of May, the blue-birds had eggs, if not young. Now *the martins* arrived in numbers, visited the box, and a severe conflict ensued. The blue-birds, seemingly animated by their right of possession, or for the protection of their young, were victorious. *The martins* regularly arrived about the middle of May for the eight following years, examined the apartments of the box in the absence of the blue-birds, but were uniformly compelled to fly upon the return of the latter.

"'A box replete with that beautiful traveller [*the martin*] is not very distant from my bed head. Their notes seem discordant because of their numbers; yet to me they are pleasing.

"'The industrious farmer and mechanic would do well to have a box fixed near the apartments of their drowsy laborers. Just as the dawn approaches, *the martin* begins his notes, which last half a minute or more; and then subside until the twilight is fairly broken. An animated and incessant musical chattering now ensue, sufficient to arouse the most sleepy person. Perhaps chanticleer is not superior in this beneficial qualification; and he is far beneath *the martin in the power of annoying birds of prey.*'

"*The purple martin*, like his half-cousin, *the king-bird*, is *the terror of crows, hawks, and eagles.* To observe with what spirit and audacity this bird dives and sweeps upon, and around the hawk and the eagle, is astonishing. He also bestows an occasional bastinading on *the king-bird* when he finds him too near his premises; though he will at any time instantly co-operate with him in attacking the common enemy.

"*Wasps, bees* [including bumble bees?] and *large beetles* seem his favorite game."

D. T.

(*To be Continued.*)

ART. LXXVII.—*Remarks on back numbers of the New-York Farmer.*

Vol. 1, p. 272. In the year 1820, I saw a *beech* tree that was struck with lightning, near the line of the Erie canal, 35 miles west of Rochester. It is very rare, however, to see this tree or the *sugar maple* injured in that manner; and the reason assigned is, that their roots never penetrate to much depth like those of the *oak* or *black walnut.*

Vol. 2, p. 97. Some orchardists have believed that ice or snow at the roots of peach trees, would prevent the flowers from coming forward so early in the season. But a correspondent in the *American Farmer*, mentions a branch of a rose bush, that was drawn into a warm room, and vegetated while the rest of the shrub was exposed to frost and snow; and GUTHRIE, in a letter to the Editor of the BEE, says it is difficult to transplant trees near St. Petersburgh, in Russia, because in spring the leaves expand before the ground is thawed. It is therefore concluded that snow or ice at the roots of trees, can be of but little use in retarding the blossoms in spring.

Vol. 3, No. 1, p. 25, col. 2. What are we to understand by the white maize of *China?* Botanists know of no Indian corn but what has been derived from the Aborigines of the American continent. I saw a variety of this grain, forty years ago, near Philadelphia, which produced a flour nearly as fine and as white as the best wheat.

Cultivators *too often* care but little on what part of the globe a plant is found if it suit them, and one name is as good as another; but *the Horticultural Society of Paris* ought not to lend the weight of its name to propagate errors, even in so trivial a matter.

How little reliance can be placed on popular names, may be learned from Boyer's Dictionary, when *bled de Turquie* is given as a common name in France as American Indian Corn; and botanists well know that

"the French marigold" and "the African marigold" of the gardeners, are both natives of Mexico.

As an appendix to this article, I subjoin the following from the *London Times*.

"*Indian Corn.*—We have been for many years perfectly acquainted with its culture and qualities throughout the south of Europe, where it has *always* been grown, and where it is called Turkey corn, in French *bled de Turquie*. There never could be any question, but that it would grow and ripen in England; in fact it has *always been grown* as an object of curiosity. But who would grow this trash that can grow wheat? By itself, the Indian corn makes a nauseous, clammy bread of a bright yellow color, and if mixed with wheat it has not half the heart and support in it that are to be found in wheaten and rye bread, mixed in the same proportions. Let any one in proof of this look at our hardy and muscular population of the North of England, who have no other bread than that of this description. The two kinds of corn are there sown, grown, and reaped together, and are called hard corn or meslin [corruption of miscellane;] and a wholesome nourishing bread it makes. At the two extremities of Italy, the poor have two kinds of bread, the produce of their respective regions. At the foot of the Alps, they have a bread made of chesnuts. In the Abruzzi and Calabria, their bread is constituted of this Indian corn, but the two kinds are equally wretched. The chesnut bread of the Alps occasions nodosoties, swelled joints, and ultimately contracted limbs. The Indian *bread* gives swine the mange [!!!] and man the scurvy [!!!!] But when nothing else can be produced, man must be content to sustain life on such terms as he can."

Remarks.

We know it not, but think it probable that the foregoing paragraph was intended as a squib against Cobbett, who has endeavored to introduce the culture of Indian Corn in England: and perhaps it has more reference to politics than to agriculture; but as some of the statements are *so very incorrect*, it may be proper in *this land of well ripened corn*, to point out those errors.

The celebrated ARTHUR YOUNG, witnessing the benefits of the maize crop in France, regretted (in his Travels) that the climate of England was too cool for the growth of this grain; and in these United States, perhaps the loss of no crop is attended with as much inconvenience to the domestic economy of the farmer. We know of no new settlement that has been prosperous where Indian corn fails or only yields a scanty return.

With us, swine fed on maize are never mangy. Every good farmer knows that as a general rule, the quality of pork depends on the food; thus beech nuts produce a sweet but oily *pork*, with *lard* that must be kept in jars, or vessels that cannot leak; but none has ever been produced equal in *hardness* and *value* to "corn-fed pork."

Now for the scurvy. WASHINGTON, the Father of his Country, ate Indian corn bread as a part of his daily food. The late professor B. S. BARTON, in his "COLLECTIONS," calls "maize, or Indian corn, *the blessing of our country*. Its importance as an article of *diet* is sufficiently established by the experience of whole nations."

DR. DARLINGTON, in his *Florula Cestrica*, remarks, just, "considered in every point of view, this (Maize) is perhaps one of the most important and valuable plants which we cultivate. It is highly nutritious, and contributes largely towards the sustenance of our people. It is particularly excellent for feeding every kind of stock; and it has been well remarked, that if the agriculturists of [England] could avail themselves of our Indian corn, we should not hear so much from them on the importance of their *root crops*."

We are ignorant of the *variety* chosen by Cobbett; but since the year 1789 when ARTHUR YOUNG travelled in France, the little Mandan or Maha corn has been discovered (Zea mayz var. precox of Nuttall.) This eminent botanist calls it "Early Mandan corn," and adds, "successfully cultivated by the aborigines of the Missouri to its sources, *ripening in a climate where no other variety could exist*."

Vol. 3, No. 1, p. 26. "It was found that kelpwort *on the side of hills facing the sea*, would arrive at full maturity; but *on the opposite declivity*, although it would grow, no soda could be made from it. Now as fresh water only is evaporated from the ocean, why did the former produce soda, and the latter none?"

By turning back one page, we may read, "In very violent gales, the salt water of the Atlantic ocean has been known to cover the windows of houses on the north side of Long Island, a distance of ten or fifteen miles, so thick as to render it necessary to wash off the dried salt after the storm." And we may recollect

"————————the surf
Which the wind severs from the broken wave"

in weather far less tempestuous, and consequently of frequent occurrence. Now as the direction of this spray is *so nearly horizontal*, it is easy to comprehend that *only the sides of the hills facing the sea*, will receive it.

D. T.

[We select the following from Loudon's recent Notices of the Medical Botany, an English periodical.]

ART. LXXVIII.—*Medicinal Plants.*

Glycyrrhiza glabra. The roots of the wild Jamaica liquorice (Abrus precatorius,) "a beautiful climbing shrub, resemble so much the true liquorice in appearance and qualities, that they are often sold in India, and used as such." The liquorice is cultivated in the neighborhood of London, and in different parts of the country, in small quantities, and the roots sold to the brewers and druggists at from 2*l.* to 3*l.* per cwt. It is propagated by cutting of the small roots, planted in light sandy soil, trenched three spits deep, in rows three feet asunder, and the plants 18 inches apart in the row. A crop of onions, radishes, &c. may be taken the first year, but nothing of this kind during the second and third summers. At the end of the third summer, the roots are taken up, trimmed of the side shoots, which are reserved for cuttings, moderately dried, and tied in bundles for sale. The extract is obtained in maceration in boiling water; then boiling, straining, and evaporating. It is prepared on a large scale abroad, and imported chiefly from Spain. The powder of liquorice sold in the shops is often mixed with flour. "Unlike other sweets, liquorice has had the reputation, from time immemorial, of allaying thirst, which property is attributed by Cullen to an acid and

bitter matter, which follows the extraction of the sweetness by chewing. Under the form of extract, it is in common use as a demulcent, in coughs and hoarsenesses; and is sometimes taken to relieve acidity of the stomach. It is also employed to cover the unpleasant taste of several bitter and nauseous drugs, particularly aloes and Peruvian bark."

Marrubium vulgare; Common Horehound. The active principles of this plant appear to be a bitter, extractive, volatile oil, and gallic acid. It is a popular remedy with the poor, is tonic, producing an increased flow of urine, and in considerable doses gently aperient. "The nostrum, sold as *Balsam of Horehound*, consists, according to Paris, of infusion of horehound and liquorice root, with double the proportion of proof spirit or brandy; to which is added opium, camphor, benzoin, squills, oil of anniseed, and honey, a remedy for consumption, forsooth!!"

Veratrum Album; White flowered Veratrum, or White *Hellebore.* A native of the mountainous districts in most of Europe from Norway to Greece, but not in Great Britain. In the Alpine pastures of Switzerland, this stately plant, accompanied by the Gentiana lutea, makes a magnificent appearance. The root, which is the part used in medicine, is tuberose and ramose, with a disagreeable odour, and an acrid, nauseous, and bitter taste, "excoriating the mouth and fauces; while the powder, if applied to wounds, produces effects on the animal economy of a highly deleterious nature, the whole plant being in fact poisonous. If applied to the membrane lining the nose, it proves a violent sternutatory." In the chemical analysis of the root, a poisonous principle can be separated, and is known under the name of Veratrine. The same principle is discovered in every species of the genus, and also in the bulb of Colchicum autumnale. Taken in any form, the Veratrum, or White Hellebore, is a violent poison. In medicine it is applied in cases where it is necessary to excite quickly a strong action of the bowels. "When given with this intention, it has answered very well in the case of old people, when an enormous accumulation of feces existed in the larger intestines." It is employed, conjoined with opium in gout, and was at one period considered the active ingredients of the *Eau Medicinale.*

Cucumis Colocynthis, the Colocynth or Bitter Cucumber. This trailing annual is abundant in Turkey, and is "supposed by many to be the plant described in the subjoined passage of holy writ:—'And one went out into the field to gather herbs, and found a wild vine, and gathered thereof wild gourds his lap full and came and shred them into the pot of pottage; for he knew them not. So they poured out for the men to eat. And it came to pass, as they were eating pottage, that they cried out, and said, O thou man of God [herbalist?], there is death in the pot. And they could not eat thereof.'" Given in over-dozes, it acts as a drastic purgative, to such an extent as to bring on delirium; which, after a time, goes off by drinking milk. "No cathartic is more highly prized, nor oftener used."

Salix Russelliana. The bark of this species, and of S. alba and others, contains tannin, and, it is said, has been found useful as a substitute for cinchona. The S. Russelliana, or Bedford Willow, is the most profitable for cultivation of any species of the genus, not only on account of its timber, but also for its bark, its rapid growth, and its handsome aspect. The Huntington, Dishly, and some other species, come very near it.

Juniperus communis. "The leaves of the Juniper are balsamic and agreeable; to the taste resinous, and somewhat bitter. The berries have a very agreeable odour, are soft warm, and bitterish. They contain sugar, mucilage, a small quantity of light essential oil, of a white or yellow color, possessing the flavor of the juniper, and a strong smell. A writer in the *Jour. Pharm.*, 1827, p. 215., asserts, that the berries contain an essential oil before their maturity, turpentine when ripe, and a resin when dry on the tree. Most of those which are used in this country, are brought from Holland and Italy; and they should be chosen fresh, not much shrivelled, and free from mouldiness. The Italian are said to be the best; gum sandarach, or vernix, as it is commonly called, is an exudation from the J. communis, growing in warm climates; though that which is generally met with in commerce is the produce of the Thuja articulata, or Jointed Arbor-vitæ. It is commonly used as *pounce.* Medically, juniper berries are carminative and diuretic; and given in the form of infusion, combined with other medicines of the same properties, will often be found to act freely on the kidneys. This virtue of the berries depends on their essential oil; and as the tops of the plant also contain it, they are sometimes used. The wood is considered to be sudorific, and has been occasionally substituted for guaiacum and sassafras. Linnæus states, in his *Flora Lapponica*, that a decoction of juniper berries, when fermented, is used in Sweden as common drink; but the assertion of some writers, that it is substituted for tea and coffee, he contradicts."

Juniperus Sabina. The leaves and tops "give out a great part of their active matter to watery liquors, and the whole to rectified spirit: tinging the former of a brownish, and the latter of a dark green, color. Distilled with water, they yield a large quantity of essential oil, on which the activity of the plant depends. Savin is a powerful stimulant, and was once much employed as an emmenagogue. A strong decoction of the powder has often been given in large doses, with a view to procure abortion; but if it be capable of producing such an effect, which is very doubtful, it is when it acts as a hydragogue purgative."

Euphorbia officinarum. A prickly lactescent shrub from Africa. The euphorbium of the shops is obtained by making slight incisions in the plant, from which exudes a milk like juice, that concretes into oblong or roundish tears. This substance excites an extremely violent local action; solid, or as milk, it proves highly acrimonious, inflaming and ulcerating; as powder, it is the most violent errhine that we possess. When a minute portion is mixed with powdered starch, and taken as snuff, it has, like the powder of Asarum europæum, been found useful in various affections of the head. Most of the other species of Euphorbia possess similar properties. The seeds of E. Lathyrus, or Caper Spurge, have lately been proposed as a substitute for the root cacuanha, and the oil expressed from them as a substitute for Croton *Tiglium. E. Ipecacuanha* is both emetic and cathartic. E. corollata possesses double the strength of jalap. E. helioscopia, the Sun Spurge, or Wart-wort, is used in many parts as a stimulating application for destroying warts and other excrescences. Two drachms of the expressed juice of this species killed a kitten in half an hour.

Eryngium maritimum. "Eryngo root has a sweet agreeable taste and aromatic smell, and it gives out its properties to water. This root was formerly supposed to be possessed of many virtues. Boerhaave reckons it as the first of aperient diuretic roots, and it has been recommended in gonorrhœa and visceral obstructions, particularly of the gall-bladder and liver. Menstrual suppressions are reported to be removed by it, and quartan agues are likewise stated to have yielded to it. To crown its other virtues, it is much esteemed for its supposed aphrodisiac qualities; and at Colchester, where the candied root is prepared, considerable quantities of it are still sold, we are informed, in consequence of Her Majesty Queen Charlotte being presented with a box of it, as she passed through that town on her first arrival in England. It is now little used by medical practitioners; but while we are taught to believe by respectable authorities that two grains, and even one, of blue pill for a dose, can act beneficially on the system, we see no reason why this root, and many others, should be destitute of all virtue, when properly administered and judiciously persevered in, even though their direct effects on the system manifest themselves in no very evident manner. The E. campestris, or Field Eryngo, with deeply divided leaves, which grows naturally in our meadows and pastures adjoining the sea, is said to possess the same qualities and medical properties, and is preferred on the Continent."

Geoffroya inermis; Leguminosæ. The smooth Geoffroya, Bastard Cabbage tree, or Worm Bark tree, is a native of Jamaica and Martinique: it is lofty, with white wood, which is so tough as to be preferred beyond all others for the shafts of carriages. The bark is used as a worm powder in the West Indies; but, though included in our Materia Medica, is very seldom prescribed.

Dorstenia Contrayerva; Urticeæ. A perennial from South America and the West Indies, with fusiform, compact, rugose, knotty roots, which have an agreeable aromatic smell, and a rough, bitterish, warm, acrid taste. It has been considered stimulant, sudorific, and tonic, but is now little employed.

Boswellia, (by Dr. Roxburgh, in memory of the late Dr. John Boswell, of Edinburgh) *serrata;* Nat. Ord. Meliæ. A lofty tree of central India, which produces the gum Olibanum of commerce. This substance distils from incisions made in the bark of the tree during the summer months. It is frankincense of the ancients, the *thus* of the Romans, and the *libanos* of Theophrastus and Dioscorides. "In the early ages, it was much used as incense in sacrifices; and, in modern times, the Greek and Romish churches still retain the use of frankincense in some of their ceremonies." When heated, it burns brilliantly, and diffuses an agreeable odour, and is chiefly employed as a perfume in the rooms of the sick.

Saccharum officinarum. The Chinese date the cultivation of the sugar-cane from the most remote antiquity. Dr. Roxburgh considers the species cultivated in China as distinct from that grown in the East and West Indies, and has named it sinense. It is believed to be indigenous in the south-east of Asia. Marco Polo found abundance of sugar in Bengal in 1250. About the close of the 13th century, its cultivation was extended to Arabia, Egypt, and Ethiopia. From Africa it migrated to Spain; by the Spaniards it was taken to the Canary Islands, in the 15th century; and, by the Portuguese, from Sicily to Madeira. In the beginning of the 16th century, the sugar-cane was conveyed by the Spaniards to the West India Islands and the Brazils. "It is a remarkable fact, that the sugar cane in the West Indies never perfects its seeds, the plants being propagated always by cuttings from the roots. Dr. Roxburgh, who resided many years in India, never saw the seed of this plant." There are several varieties: that chiefly grown in the West Indies is called the country cane; it is propagated by cuttings, and requires a rich soil. The cuttings are taken near the top of the stalk, and laid horizontally across the ground. In Jamaica and the west India Islands, the canes are usually cut for the purpose of making sugar immediately after the autumnal rains, when the plant has acquired from 8 to 12 feet in height.

[For the New-York Farmer.]

ART. LXXIX.—*Lime, as a Manure.* By AGRICOLA.

The 'Science of Agriculture,' in our country, as the late Governor Clinton called it, seems amazingly tardy in adopting the use of *Lime as a Manure;* and perhaps few circumstances go farther to prove, that, whatever it is desirable it should be, the common agriculture of this country can hardly yet be called a science. Something has been done, I grant, towards making '*Farming on Paper,*' somewhat literary, by the late experiments in *Agricultural Societies,* and our *Board of Agriculture;* but science has not yet infused much of its spirit, or life, or light, into the business of the common farmer. He goes on, in the same old way, still considering *that* the *best Farming, which* is the *most profitable,* a *test* little regarded by those, who, with our late Governor at their head, were for at once raising Agriculture to the dignity of a science, principally by literary effort! The hobby, however, had its day, and is gone.

Some good, no doubt, has resulted from it, if only to teach others what was exactly the wrong plan of proceeding. Profit, disguise the fact as we may, is, and ought to be, the main object in Farming. If one man, say one in a thousand, is regardless of the expense of producing a few more bushels of corn or maize, than his neighbor, and care not if it cost him twice as much as the market value of the articles;—and nine hundred and ninety-nine in a thousand look only at the profit, then what good can arise to '*the Farming Interest,*' by awarding premiums to loss, and thus dishonoring profit? Such was our late plan. Such "*scientific farming,*" as this, might well fall into disrepute. Farming, whether an art or science, requires the constant aid of common sense.

Lime, on some soils, is the cheapest of all manures; but on some others, it would be good for nothing; and here, science may be thought necessary, in order to direct the application. Yet, after all, experience is better than every thing else. In analysing, to discover where lime is wanted, the man of science makes his mistakes, or blunders: while experience is infallible. Let one man, by the aid of lime, prove that it is cheaper than dung, or than any manure, accessible, and his neighbors will follow the example, on similar soils. It is more profitable, and all men are seekers of profit. Your literary farmer, perhaps a director at an agricultural society, may laugh at this, sneer at the 'stupidity' of the Farmer-in-fact, because, forsooth, he will not abandon the idea of profit, and give up all his '*old*

notions,' in exchange for the *new ones.* In his turn, also, the real Farmer will laugh at arrogant pretensions and turn away from such *Teachers* as cannot show him how to make his labors more productive. If any of them can show him a garden, or a farm cultivated under his direction, with superior skill, yielding increased profits, the Farmer, depend upon it, will soon be for taking some lessons. So, also, if this teacher's garden, or farm, is in a slovenly, neglected condition, overrun with weeds, talk to him as much as you will, of scientific agriculture, of the aid of chemistry, in the analysis of soils, and the choice of manures, still he will disregard your pretensions, as well he may. He, only, is fit to be a teacher, in any thing, who clearly proves his superior excellence in a knowledge of it, applied to use.

The farm and the garden, are the schools of agriculture and horticulture, and the successful farmer and gardener the best schoolmasters. It is perfect nonsense, to talk of learning agriculture, 'scientific agriculture,' in a school without a farm.

If you, Mr. Editor, are one of the Paper Farmers, it may as well now be discovered, and I shall know how to bestow my future labors, to which this article may prove a kind of introduction.

My garden had a soil,—if soil it could be called,—of a little gravelly and sandy earth, intermixed with gravel of slate-rock, perhaps nine tenths of the whole, in weight, to 1 foot deep, stone, in small pieces, from the size of a pigeon shot, to an ounce ball and a hen's egg. The larger stones, many waggon loads, many of which were used in paving the common flinty paving stones, had been removed. Four years ago, I began to apply lime, as a stimulant and manure, as well as to assist in the decomposition of the slaty-rock fragments. The ground is laid out into squares, by intersecting walks and alleys. One square, only, was limed the first year, by strewing the fresh dug surface with so much lime as just to whiten it, twice in the season, once for each crop. The lime was left on the surface, but scratched in, a little, with a garden rake. By the next spring, the superior mellowness of this square, on being dug, was very apparent, and the change of color, of the soil, most conspicuous, so as to be discovered at several rods distance. Old, experienced, and very sensible practical Farmers, saw this, and that the soil was becoming more loamy. Encouraged by this experiment, I have since used lime, only, instead of dung, and by my neighbors, and with the most marked and decided advantage. The soil has become a dark chocolate colored loam, light, warm, mellow, and the little stones are rapidly disappearing. Four years have produced a very great change. I wish every body knew how great, and at what a trifling expense. On a Garden of $\frac{1}{8}$ acre, the whole of the lime, used, has not cost over 2 dollars, in 4 years, which would only purchase 4 loads of dung, from the stables! My garden now has a soil of very superior excellence. It stands the draught well, and is dry, and warm, early in Spring. On one Garden near me, similar soil, not larger than mine, upwards of 100 wheel barrow-loads of horse dung, have been applied this Spring. Another, adjoining, dressed with dung last Spring, had its potatoe tops die, by drought, in July, or August, yielding hardly the seed, and mine remained unaffected, green into October, a good yield. AGRICOLA.

April 1, 1830.

Remarks by the Editor.—If ploughing with a sharpened goose quill, and irrigation from an ink-bottle, constitute a *paper farmer*, in distinction from one actually tilling the soil, we are one: if extensive scientific information in connection with some practice, *Agricola* is one. That portion of his communication detailing his experiment, is a striking and beautiful instance of the benefit of science or paper farming in practical agriculture. We know Agricola to be one of the most extensively informed, particularly in practical scientific information, of any in our country. Now, had he not been chemically acquainted with the properties of lime, we do not believe he would ever have departed so far from the custom of his neighbors as to have applied lime "to assist in the decomposition of the slate rock fragments;" and had he not been a *paper farmer*, he would not have committed the result of his experiments to writing for the benefit of the public. There is almost an infinity of circumstances and constant changes connected with vegetation. The use of science to a farmer, is to enable him to adapt his operations more in accordance with these circumstances and laws of action; or, in other words, to cause him to look at all things around him, to think, and to reason, and then do as Agricola has done.

In all our reading, we have discovered no instance of agricultural writers advancing sentiments in any ways different from this, that the "best farming is that which is most profitable." Of the three volumes published by the Board of Agriculture of this state, all three of which can be read with great advantage by every farmer, two are almost entirely made up of communications from practical farmers, detailing their experience. If our agricultural societies awarded premiums for some things on which there was a loss in raising, what man, having views extending beyond his door-yard fence, would think of abolishing such associations, even before they had time to profit by their own experience? The *science* of profitable agriculture would not have moved so "amazingly slow," had not prejudice and contracted views frustrated the enlightened plans of Clinton and his associates.

Science, or the analyzing of the soil, may be necessary before even Agricola's "experience is *infallable*" for others. A farmer having no knowledge of mineralogy may think he has a soil perfectly like that which Agricola has described, but owing to some real difference, which a scientific eye would have discovered, he may fail, in his application of lime, and thus be led to condemn the innocent *paper farmer.*

We would ask Agricola, why is it more nonsensical for young men designed for the plough, to derive aid from a school of scientific agriculture, than to send others directly from a mercantile school to the counting room? Are not those clerks preferred who have gone through regular courses of book keeping, under our most distinguished teachers, particularly after some experience? We say it is not perfect nonsense to talk of teaching those sciences that have a very intimate connection with, and important bearing on, agriculture, at a school unconnected with a farm. We grant, however, that it is far better to unite theory and practice in teaching. If a man of science commits a mistake in the application of his scientific knowledge to practical agriculture, he is held up to ridicule, and regarded as a beacon among dangerous rocks.—This, perhaps, is well enough; but yet we believe there are thousands of farmers, who die insolvent, whose es-

tates more reading and more scientific intelligence would have saved. Among a certain class of farmers there is a foolish prejudice against all agricultural information in a book, whether theoretical or the result of a long practice. They consider all who either write an agricultural work, or a communication for a periodical, as paper farmers. But we hope brother Agricola will not let the epithet deter him from affording us the benefit of his "future labors."

ART. LXXX.—NATURAL HISTORY.—*Infancy of Animals.* By the EDITOR. [Continued from page 70.]

"Hail—to this teeming stage of strife!
Hail—lovely miniature of life."

The offspring of the human race continue in a state of infancy longer than the young of any others of the animal kingdom. Although an infant remains imbecile a great length of time, yet its helplessness is not greater than that of many young animals. As soon as born, although it cannot move, its perfectness of organization enables it to drink the 'balm of life,' when presented to its mouth. The young of the opossum, rabbits, rats, &c. are, for a short time, equally helpless.

Unlike many quadrupeds, the human infant enjoys the pleasures of vision on first coming into the world. The ills and pains of infants have been asserted to be greater than those of the offspring of the lower creation. With equal truth can it be said that their joys are greater. Much of the sickness in infancy, among civilized nations, is unquestionably to be attributed to false tenderness, luxurious and intemperate living on the part of wealthy parents—and among the poorer classes, the want of regular food and clothing, the excessive use of distilled poisons, unevenness and distress of mind, all engendering diseases that are entailed on infancy, causing nearly one half of the human family to people the grave before they are four years old. The unequal cultivation of the mental and bodily powers may also be considered as engendering a constitutional propensity that is opposed to longevity. In matrimonial alliances, an exclusive regard to a pretty face, or some adventitious circumstance, as property, for instance, to the entire neglect of those constitutional formations, an attention to which has insured a great additional symmetry, beauty, health, and vigor in some of the quadruped race, is unquestionably the cause of many of the bodily ills of life.

As a general rule, the duration of infancy is proportioned to the sagacity or mental powers of the different classes of animals. Birds arrive at maturity in less than six months. They are thought to be inferior in sagacity to quadrupeds that require longer time.

Fishes generally require no protection or aid from their parents, but are enabled to provide for themselves as soon as they escape from their eggs. As far as their habits are known, the inhabitants of the deep are the most stupid of the animated kingdom, particularly when taking their magnitude and activity into view.

Owing to the many changes and variety of forms which insects assume, it is difficult to ascertain what period of their existence corresponds with that of infancy in other animals. With very few exceptions' nature is the only nurse. The eggs, however, are deposited with so much care, and under such favorable circumstances, that the envelope is not burst until food is already prepared by the operations of nature. Bees and some others, on the contrary, construct nests and feed their young with the most assiduous and anxious care.

In all the various circumstances and duration of the helplessness of animals, the provisions of nature are ample and most admirably adapted to infantile wants.

The short period of existence allotted to most insects requires a freedom from providing nourishment for their young. The long duration of infancy in the human race affords employment to the active mind of the parent, nourishes the gentle and tender feelings of the heart, and serves to repress that hostility existing among mankind, which is constantly tending to break the ties and bonds of sociality, friendship, and peace.

ART. LXXXI.—*Miscellaneous.*

Manure for Grasses and Asparagus.—J. W. Smith, M. D. of Lockport, N. Y. in a communication to the American Farmer, says, he has "found from experience, that the coal dust cinders, and scales of iron, or black oxide of iron, from the blacksmith's forge, when properly mixed with *fine garden mould*, to be *incomparably* the best manure for the grape that can be used.

"For asparagus, I have also made use of finely pulverised oyster shells, well incorporated with the earth in which it is planted, or well dug in about the roots of old beds. Its effects are astonishing, especially on old beds."

To preserve Hams.—A writer for a paper, called "*The Genius of Liberty*," who signs "*John Potter*," says, "I have for more than twenty years past, kept meat hanging up in my smoke house, through the summer season, and no fly or bug has injured it.

"To prevent such injury, I take clean strong ley, made of wood ashes; I commonly boil it, to make it stronger than it it generally runs off, then I take my bacon or smoked beef, having two or three gallons of the ley in a large iron kettle, I take each piece of meat, and dip it into the ley, so that it is completely wetted with it, then I let it dry: then I hang the meat in its former place. By this process I have invariably found that it kept the meat free from bugs and worms, and no taste of ley is ever perceived, not even on the outside."

To preserve steel from rust.—Take some melted virgin wax, and rub it over the article to be preserved. When dry, warm the article again so as to get off the wax, and rub it with a dry cloth until the former polish is restored. By this means all the pores of the metal are filled up without injury to the appearance, and rust will not attack it unless it is very carelessly exposed to constant humidity.—*Journal des Connaissances Usuelles.*

☞ Several articles prepared for this number have been unavoidably omitted.